

# American Bee Journal



Vol. 95 No. 6

JUNE

1955

# Don't Miss the Boat!



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## THE AMERICAN BEE JOURNAL

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**1955**

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Queens, 1 to 50, \$1.00 each; 50 up, 90c  
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Italians

Starlines

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All these along with the high production records. The  
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Sorry—No more Italians after June 1.

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**AMERICAN BEE JOURNAL**

HAMILTON, ILLINOIS

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**BEE CALM with Taylor's HIVE BOMB**

## PRICES AFTER MAY 20th

Fill those empty hives with bees if  
you haven't done so already.

We will also have plenty of good queens  
at these low prices.

### ITALIANS OR CAUCASIANS

#### PRICES

	Queens	2-pound & queen	3-pound & queen	4-pound & queen	5-pound & queen
1-24	... \$ .75	\$3.00	\$3.75	\$4.50	\$5.25
25-99	... .70	2.85	3.55	4.25	4.95
100 Up	... .65	2.75	3.35	4.00	4.65

Queens Postpaid-Airmailed and/or Clipped  
No Extra Cost

**Tested Queens—\$1.50 each**  
Queenless Package—Deduct Price of Queen  
Packages F.O.B. Shipping Point

## THE STOVER APIARIES

Mayhew, Miss.

## Comments

**MAINE**—We are enthusiastically in favor of your new volume. The articles on Nosema were so timely that they seemed to be written just for us as we lost some colonies that way last spring. The articles on royal jelly share the spotlight with the one on honey bee communications. They are fascinating. And the recipes prove thrifty as well as delicious. Please, too, keep ample space for Comments and Editorials. —Dorine R. Tupper, Skowhegan.

**ONTARIO**—In recent years, beekeepers and others interested in honey have spent a great deal of time and money publicizing the idea that honey is a great quick-energy food. The idea is certainly not new and was expressed very well by the beekeeper friend of Peter Neagoë, who tells of his boyhood days in Transylvania, in his nostalgic biography "A Time to Keep" (published by Howard McCann, Inc.) His Uncle Gherasim offered the boy honey to warm him up, explaining that in cold weather honey was the best fuel to put in the stomach, that it burns like dry birchwood. Of course, he added, dry birchwood burns fast with bright flames, but it does not last like oak or beechwood. Therefore you must take a good piece of bread with it. Honey for a quick fire, bread to make it last longer. Pretty well expressed, I'd say.—Henry J. Down, Kincardine.

**AUSTRALIA**—The recent disastrous floods which caused such devastation, grief and loss in Maitland, New South Wales, may delay the publication of our material on bee diseases in the "Australian Beekeeper." I believe Pender's offices and the factory escaped the flood but many of their employees have lost everything.—Many Australian apiarists feel that a more frequent interchange of news and views between your country and ours would be desirable as we rank second only to you in world honey production.—W. H. Aughterson, Victoria.

**CONNECTICUT**—You say the Journal this year is supposed to be made up in two parts, one for the commercial beekeeper and one for the small beekeeper, so the Journal carries information you need, whether you are a large or a small enthusiast. This is very desirable but why not invite articles? (We do. If any reader has any item to contribute, even a small one, it will be welcome.)—George Van Santvoord, Lakeville.

**WISCONSIN**—Here are two bucks for a year. I don't know a thing about bees except that they sting. Two years ago a young fellow had three hives on our place and they swarmed. There were six clusters. A neighbor who had bees helped me and we got them all in one hive but a day or so later another neighbor said there was a swarm in his yard on a tree, so I took a look at my hive and the bees were gone. I brushed the bees in a bag but the bees didn't like that and I got hit twice on the forehead and twice on the arm. Had my sleeves rolled up. When my wife came home I was watching TV and she didn't know me. My face sure was swelled up. At work next morning the guys didn't know me either. My eyes were about shut so the boss sends me to the first aid room and the nurse sent me home. When my wife hears me mention bees she about has a fit but I still want some. So keep the Journal coming for another year.—Charles M. Curtis, Oak Creek.

# Abroad

## Egypt

In the Christian Science Monitor (U.S.A.), November last, Marion Sorenson writes about how the Food and Agricultural Organization (FAO) teaches agricultural trainees how to build modern beehives out of locally available material. The fellahs along the Nile may average an income of only about \$100 a year. One of the ways these poor farmers have of making their income is beekeeping. However, in the Menouf area, although there are about 85,465 beehives only 465 of them are modern hives. The rest are native mud hives fashioned into cylindrical tubes. The modern hive will produce a minimum of 40-50 pounds of honey a year against the fellah's mud hive average of 5-6 pounds. The trainees succeeded in making a promising hive with a framework of date palm branches, well dried, cut according to measurement and fitted in a special design. They are inexpensive and fit into the 54c limit that FAO has established as the maximum cost per hive.

## France and Spain

### Book on Royal Jelly . . .

In France and Spain, the recent agitation in favor of the use of royal jelly as a human ailment is emphatic.

Raymond Dubois, apparently in answer to a demand for an explanation of the structure of royal jelly and its possible application to human needs, has written a 100-page book "Le Miracle de la Gelee Royale" (The Miracle of Royal Jelly).

Mr. Dubois paints a fair picture of the value of royal jelly in the production of the honey-bee queen, as well as in the first two days' food of the worker larvae; and in the food for the queen bee as she proceeds in her activity, laying sometimes more than her own weight in eggs in a single day.

He then discusses the composition of royal jelly, its richness in vitamins, hormones, biotin, and other elements of value in modern therapeutics, as well as some of the claims made for it in actual use by man.

According to its author, the book has had a distribution of 15,000 and is soon to appear in Egyptian. To those interested, a copy of the book (in French) may be obtained by sending \$1.00 to the author at Saint-Martial-de-Gimel, (Coreze), France.

## Switzerland

### Foulbrood . . .

Report from Dr. Henkeler in "Schweizerische Bienenzeitung" indicates that European foulbrood is now more common in that country than American. This 47th report indicates that foulbrood insurance is still popular with the beekeepers. It has been in use for many years. For American foulbrood, the bees are still either sulphured and destroyed or "brushed" off the old combs into clean quarters. Terramycin is used on practically all colonies with E.F.B. with recommendations of "feed-contract- and keep warm," and in the case of weak colonies a uniting to form stronger colonies as a means of combating the disease.

H. M. Fraser

## PACKAGE BEES

Reports indicate little honey will be carried over into another season, and prices have advanced.

**Now Is the Time.  
Fill Every Hive in '55.**

**Order early for shipping dates  
of your choice.**

**We feed FUMIDIL-B at no extra cost  
to you.**

	1 to 25	26 or more
2-lb. pkg. with regular queen	\$3.40 ea.	3.15 each
3-lb. pkg. with regular queen	4.40 ea.	4.15 each

For Island Hybrid Queen add 25c per package

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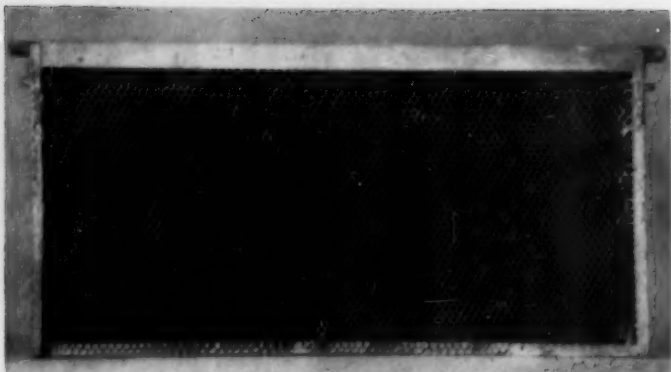
### THE FINEST HONEY SECTIONS

**We also carry a complete line of  
Beekeepers Supplies**

*Write for Our 1955 Price List*

\* \* \* \*

**BOYD - - - WISCONSIN**



This is a really good comb. How many of us can say that all of our combs are as good as this one? It is not easy to secure a set of good combs and keep them that way.

# Comb Rehabilitation

by Milton H. Stricker

**I**T WOULD be splitting hairs to point to the most important of the four fundamentals of honey production, a good queen, an abundant cluster of bees, excellent combs, and, of course, a honeyflow.

Put it this way. Suppose you have all these. Your wooden equipment can be orange crates patched with calico; your hives can face the north; your cover can be a piece of rubberoid weighted with a brick; your colony can be bottom-boardless, but, as long as that good queen has plenty of worker comb to lay eggs in, and that larger cluster of bees has lots of good comb to store nectar

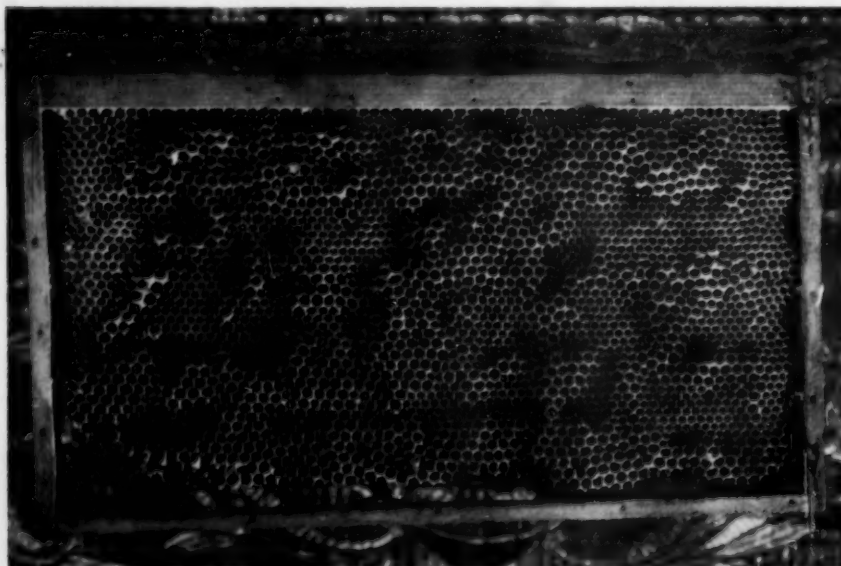
in, you'll produce a crop with a minimum of swarming.

Or, take it this way. Suppose your A number 1 queen and your cluster have comb filled with drone cells, or perhaps not enough comb for storage, where is your honey crop? Why, of course, your neighbor got it, but you didn't.

To keep combs free of drone cells, stretched cells, or other imperfections, many beekeepers use the "foundation patch" system I first heard advocated by the late E. G. Carr many years ago. He used this system until his death, and many beekeepers in this State still use it.

I must admit a good many combs are made over perfectly by this system.

During cool weather, the combs are sorted and those that show patches of drone brood are set aside for repair. Those areas of imperfections are cut out with a sharp knife, usually making a square cut. When the dandelion flow begins, these holes are filled with a corresponding piece of foundation, and the combs given to four frame nuclei that are made up just for this purpose. As many as three or four of these combs are given to each nuc and a feeder can of sugar syrup applied



How about this one? Have you combs like it? It is extreme so perhaps you don't have. Or do you do as some so often do, push these combs to the side of the hive and find later they are still there?

to each nuc. Result—worker comb in these spaces, and a comb that can be given to another colony for honey storage. More combs can be given to these nucs, or if these nucs are allowed to build up into colonies, other nucs should be made to continue the comb repair.

It seems that a small colony or nucleus with a full feeder can do this job better than a large colony. Possibly the larger colony is approaching the swarm impulse which would tend to stimulate the drawing of drone cells, which is not the case with a smaller unit.

If the section to be replaced is on one side of the frame only, a square can be scraped down to the midrib with a section uncapping knife, and a correspondingly sized piece of foundation can be stuck to the midrib with a few drops of hot beeswax. Don't try to get them to rebuild worker cells on the old midrib no matter how well you scrape it. If you do, you will quickly find how disappointing bees can be.

Many other beekeepers prefer to patch with comb, cutting pieces of worker comb out of extremely "junky" combs, and forcing them jig-saw like into the sections they cut out of the combs that have only a few imperfections.

Large pieces repaired this way can be tied in with string until the bees have sealed them in. Small pieces will be held by the expertness of the operator's "tailor-made cut." It is quite remarkable how expert some beekeepers are in cutting and fitting these pieces.

The advantage of this system lies in not having to make up nucs, or feeding sugar syrup as necessitated by the foundation patch.

At the risk of being called a capitalist (that word seems to be a dirty word any more), I will expound my own system which is neither of the above. Perhaps it shouldn't even be listed under the heading of comb rehabilitation.

I move all the supers home in the late fall after the bees have cleaned up the stickiness left by extracting and in spare moments, sort them. Those containing more than four square inches of drone brood, all those with sagging cell rows, and other imperfections are removed, cut out with a butcher knife, tamped in barrels and shipped in to trade for foundation. What a racket! I buy the foundation and eventually they will get some of it back which they will eventually sell back to me.

Listed briefly, this seems like



And here is damage at the comb edge, filled in with drone and thick wax. Many combs like this are left year after year.

quite a chore, and anyone who has not sorted combs for some years would go broke trying to replace his combs if he used this system. But I have been sorting like this for years, so my comb casualties each year are less than ten per cent. Since I like to add a super of foundation during the dandelion flow, these eliminated combs will offer the frames that I can use to install the new foundation in to use for this most important super.

Important super? Yes, foundation applied during the dandelion flow in New Jersey will not only give good combs, but will put the "control bees" to work secreting wax and will help eliminate the chances of swarming in the critical swarming period that follows in this state.

Perhaps I am too fussy about having as near perfect combs as possible, but I run my bees without excluders and if the queen decides to lay in the third or fourth story, I want all worker comb up there.

It might be well to spend a few moments on how to keep your combs in excellent condition. After all, doing the best one can to keep his combs free from damage is cheaper than replacing a large number of combs.

Putting the entrance stop or mouse guard on a colony promptly in early fall is a good way to keep mice from ruining the front end of a lot of good combs. Once they build a nest in there, the bees will patch that hole with drone. I seem to be guilty of this, so each year I promise myself to restrict the en-

trance on September 1st, but never seem to do it until October 1st. Result—a few mice in a few colonies and goodbye good comb.

If combs are stored until late summer, be sure to remember to fumigate them once a week during May and June to keep wax moths from taking their toll. Someday I am going to permit myself the luxury of a comb cellar that can be fumigated with methylbromide.

A good way of keeping combs free of wax moths in the early months is to store them in the local cold storage plant. These are usually empty at this time and rates are cheap, and if handled carefully, or not at all while in storage, they will come out free of wax moths and can be hauled right to the bee yard and used for supering.

Knowing when to put on supers of foundation to draw the best combs will result in better combs and less culls. For a long time I thought there were other more important things that spelled a good beekeeper but now the more I think about it, the more I am inclined that knowing how, when and where to super is the key to being looked upon as a successful beekeeper.

Buy the best foundation that you can afford. You can draw good comb on poor foundation in an excellent flow, but since there are so many mediocre flows any more, it pays to get good foundation. You'll get better combs that way and they will stay good longer for you.

New Jersey

# The Distinctive Odours of Honeybee Colonies

by Ronald Ribbands

Both Ronald Ribbands, and L. Bailey (opposite page), are at the Rothamsted Experimental Station. Ribbands is author of "The Behavior and Social Life of Honeybees." (See page 352)



## BEE SCENT

OVER fifty years ago—in 1901, to be exact—Frank Sladen recorded in *Gleanings in Bee Culture* that he had noticed a distinct and somewhat pungent odour arising from a swarm of bees which he was putting into a hive. He noted, moreover, that at the same time many of the bees at the entrance of this hive were fanning with their wings and standing with the tip of their abdomen raised to expose a portion of the soft membrane which connects the fifth and sixth segments of its upper surface.

Sladen then killed several bees, dissected off the membrane, and showed that this material was attractive to other bees. He established that the odour which he had recognized came from this membrane, and he concluded that bee scent (and not the noise of the vibrating wings, as had hitherto been supposed) was the means of allurements with which the fanning bee was enabled to attract her companions and encourage them to enter the hive.

The scent organ is exposed in other circumstances when it would be useful for a bee to attract her friends. For example, the bees which are collecting from a dish of strong sugar solution frequently scent in this way, and in 1923 Karl von Frisch found that the frequency of this scenting tends to be proportional to both the concentration of the syrup and the ease with which it can be obtained. Much less frequently, bees which are working on flowers may also expose their scent organ.

Here one may note that beekeepers' vocabulary has not yet been modified to take account of Sladen's observation. They speak of "fanning" bees; for ventilation purposes a bee may fan with its wings without scenting; alternatively, while drinking from a dish of sugar syrup it may expose its scent organ without moving its wings; at the hive entrance, for orientation purposes, fanning and scenting are carried out at the same time, and a scented air current is produced.

As one might expect, honeybees can use the scent which they give out as a guide to themselves on a return visit, as well as to attract other honeybees. In addition, recent experiments which I carried out in collaboration with my friend, Dr. Hans Kalmus, have shown that this bee scent has other surprising and important properties—as beekeepers have often supposed, but have never previously been able to prove, the

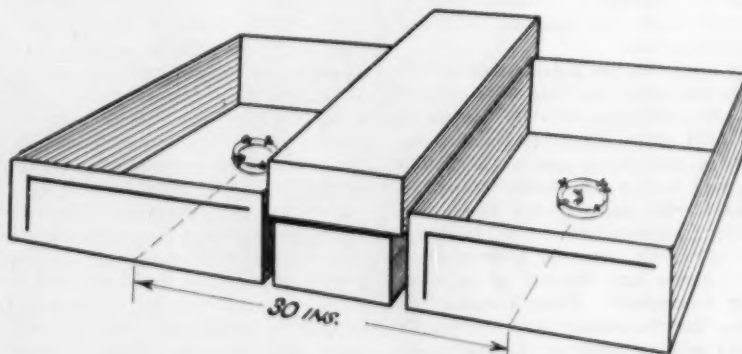
bees of each colony produce a distinctive scent, which is different from that of other colonies.

## RECOGNITION OF COMPANIONS

The simple apparatus which we used for our experiments is shown in the accompanying illustrations. Two small glass dishes are set down in a field, about 30 inches apart; each dish is surrounded by an open brood-chamber which serves as a wind-shield, and a closed nucleus box between the two dishes holds notebooks, paints and other minor paraphernalia.

Two colonies of bees, A and B, are placed fifty yards or more away from the pair of dishes, and the stage is now set for our first experiment, with the following procedure.

On the first day a group of 50 bees from Colony A are trained to collect sugar solution from dish a, and the thoraces of these bees are daubed



An apparatus for studying the attraction of companions. The two glass dishes are surrounded by a brood chamber and separated by a nucleus box.

with white paint; during this day Colony B is not allowed to fly, and dish b is kept empty. On the second day Colony A is not allowed to fly and dish a is empty, while a group of 50 bees from Colony B are trained to collect sugar syrup from dish b, and their thoraces are marked with blue paint.

As soon as the group of bees from Colony B have been marked at dish b, Colony A is also allowed to fly. Both dishes are now filled with sugar solution. For a period all unmarked bees coming to either dish are killed and ignored, until similar numbers of the marked bees from both colonies are seen to be foraging from their respective dishes. From this time onwards all unmarked newcomers are marked with the same two colours,<sup>1</sup> according to the dish which they visit, but now the daubs of paint are put on their abdomens, so that they can be distinguished from the guides which were marked previously.

When about a hundred newcomers have been marked in this way the

1. In repetition experiments the colours were used reciprocally on guides and recruits, and mixed in various combinations, to demonstrate that the coloured marks themselves were not being used by the bees as recognition marks.

experiment is stopped. At the end of the day the two colonies are opened, and all the marked bees inside them are killed and recorded. It is then found that most of the newcomers from Colony A have visited dish a, at which their hivemates foraged, whereas most of those from Colony B have visited dish b.

This experiment, which we repeated several times, and with various modifications, has demonstrated that when hivemates and bees from another colony are foraging in similar numbers from nearby dishes which contain exactly the same food supply, the hivemates are much more attractive than the strange bees. So, we must conclude that the hivemates are recognized in some way.

#### ATTRACTION IS BY SMELL

In another experiment, using the same apparatus, bees from one colony were trained to dish a, and no bees at all were trained to dish b. Both dishes were then supplied with sugar syrup. During the next two hours 45 recruits went to dish a, but only 3 visited dish b. Dishes a and b were then exchanged, and after some

initial confusion the trained bees now went to dish b—in other words, to a new dish on their old foraging site. During the next fifteen minutes 9 more recruits came along, and all but one of these went to dish a, which the trained bees were no longer visiting. Thus the recruits were not being attracted by either the sight or the sound of the trained bees, but they were attracted by something pertaining to the dish which they had previously visited.

The lure could only be bee scent. Moreover, as the preceding experiments had shown that dishes frequented by hivemates are more attractive than dishes frequented by strange bees, the bee scents which come from bees of different colonies must be different.

These simple experiments which I have now summarized, and which are recorded in full in *Proceedings of the Royal Society Series B*, Vol. 140, demonstrate that honeybees can recognize their companions because they possess a distinctive smell, which is different from that of the honeybees of other colonies.

Rothamsted Experimental  
Station, Harpenden,  
Herts, England

## Nosema Disease

by L. Bailey

CONSIDERABLE attention has been paid to this malady of the bee during the past few years, particularly after the discovery of the first effective drug by Katznelson & Jamieson (1952).

At Rothamsted we have approached the problem from the fundamental aspect of finding exactly how the disease perpetuates itself within the colony from year to year and why the annual rise of the proportion of infected bees in the colony in the early summer is immediately followed by a rapid decline. Conclusive answers to such basic problems are inevitably of practical value.

The reasons why infection rises in spring have long been suspected, the main reason being that the confined bees often defaecate within the hive during the late winter thus soiling the combs with faeces containing the spores of the parasite. When brood-rearing recommences these combs are cleaned by the bees, which eat the dried faeces and subsequently show a rising level of infection

which is correlated with the rapid growth of the brood-nest in spring and summer.

The proportion of infected bees falls rapidly in an undisturbed colony immediately after the peak of infection is reached. This, we considered, was the key to the problem. An understanding of this phase might enable us to assist it and thereby possibly to eradicate the disease.

Burnside & Revell (1948) correlated the decline of infection with the temperature of the brood-nest, which is normally between 34°C and 35°C. These temperatures are above the optimum of about 31°C, at which the parasite multiplies most rapidly within the individual bee. Nevertheless infection can increase slowly until the temperature reaches about 38°C. Also the temperature within the brood-nest does not affect all the bees of the colony simultaneously; furthermore, those bees most affected by high temperatures are the youngest, which are the least infected as they have had less time in

which to contract and develop the disease. It seems unlikely, then, that the temperature of the hive population could be constantly maintained above 37°C. for the necessary length of time which Burnside & Revell, and Lotmar (1943), found necessary to cure the disease in individual bees.

Relative immunity of the newly emerged summer bees could account for the decline of infection as the newly emerged bees begin rapidly to replace the old overwintered bees during the early summer. However Bailey (1955) has shown that newly emerged bees are not even partially resistant to infection.

The only likely explanation seemed to be that diseased bees normally defaecate outside the hives, and cease to transmit their infection to young bees during the flying season. If this were true the disease would disappear as the old bees die during the season. Experiments of White (1918), though not designed to test this hypothesis, provide circumstan-

(Please turn to page 243)

# California Honey Advertising Pays Off

by Kermit Wilson

"IN MY 32 years in the food business I have never seen such good results for so little money spent. I believe the maximum was achieved for the money spent on this advertising program," said George T. Hansen, long-time Alameda, California honey and food broker. It startled us so much that we sent out letters to beekeepers and honey bottlers all around the state to find out how conclusive this statement might be. Before we give the answers to those letters, we had better give you a little more background about the California Honey Advisory Board.

The Board operates under the Bureau of Markets of the California Department of Agriculture. It took a sign-up of 51 per cent of the industry, representing 65 per cent of the tonnage, to make this marketing order effective under the Marketing Act of 1937. That was done several years ago, which means that every beekeeper and every bottler must pay a pro rata amount for advertising, promotion, research and management.

The State of California collects the money and pays the bills on the advice of the Board. The assessment rate is 5 cents a 60-lb. can for the producer and 5 cents a can for the bottler or handler. The honey industry supports its own program—the expense does not come out of state tax moneys.

The Board is made up of five beekeepers, two bottlers and three handlers. There are three committees: advertising, research and budget. The Advertising Committee consists of Wendell Shore and Hood Littlefield as co-chairmen, and William Lane, Jim Crawford, Cliff Grapp and S. D. Redfield. Ray Reed is Board Chairman.

The advertising program this year consisted of radio, newspaper, magazine and store point-of-purchase cards. Publicity was produced by the California Foods Research Institute in the form of recipes and photographs which went to over 100 of California's newspapers, and radio and television stations for a period of 8 months.

Our total budget for honey advertising in California is around \$20,000, including a large booth at the Los Angeles County Fair.

From here on the rest of this article is being written by beekeepers and bottlers in the form of letters which were in answer to our request for their comments and impressions on this year's honey advertising program.

Bob Bryant, honey packer, said, "Advertisements which were set forth in publications and magazines showing the use of honey were most beneficial this year. In fact, some people approached us who did not know honey could be used for certain purposes and stated how interesting it was that they could now use honey for baking and other purposes."

Clarence Ward, beekeeper, stated, "I am well pleased with our advertising efforts. I particularly like the publicity we are getting through the California Foods Research Institute. My thought would be to have this work all year long.

"The Sunset Magazine ads were very good. I would like to see more of that next year. The Honey Bear Warren idea was a good one. Will we be able to think up as good a one for next year?

"The Fair display and questionnaire makes a good impression on the people we reach there. We see positive results there so we think our time and efforts are worthwhile. I hope others feel the same.

"Our biggest asset of all is working together through one head. We beekeepers will have to keep selling the program to some few beekeepers that do not get out to find out what is going on. The packers should sell the ideas and accomplishments of the Advisory Board to those as they buy their honey.

"I would like to see the assessment raised in a year or two. The time is not ripe yet."

Harold J. Fredriksen, San Luis Obispo beekeeper, said, "I believe the advertising program has been of great benefit to the beekeepers of California. We are seeing more

about honey in magazines and newspapers all the time.

"More people ask me for cook-books than ever, or how to use honey. They tell me they are seeing more articles on honey and recipes in the papers and magazines. We could go places if we could get the same results nationally."

Spence Redfield, Los Angeles packer adds, "From what we have observed of the promotion on honey we have been happy about it and feel that considerable good is coming from the California Marketing Act and that it is being well administered by the California Honey Advisory Board. This year's advertising program we feel is considerably improved over that of last year, primarily because it is more concentrated, and of course also experience has been gained and some good accumulating from past work. Somehow we need to get the message of honey over to the consuming public in general, and this of course cannot be done, in our opinion, except through a number of years of hard work.

"The display material received this year from the American Honey Institute and the combined efforts of all have been material that works in well with the promotion and display of honey at the retail level.

"We have encountered some criticism from the chains in that the program was not worked out far enough in advance for them to be able to successfully tie in with the promotion.

"It would be our thought that it would be well to give some consideration to the selection of a National Honey Queen so that we do not have in one section of the country a National Honey Queen and in another section of the country the selection of a different person as a National Honey Queen.

"The program, we believe, is a credit to the honey industry of California."

J. Allen Dyer, beekeeper, said, "The honey market has improved. I'm sure that advertising has been a major factor. There is a better

feeling among the beekeepers, that I feel has been brought about by learning to cooperate through the Marketing Order."

Wendell Shore, honey dealer and co-chairman of the Advertising Committee, said, "I am writing to express my personal appreciation for the fine cooperation that Mogge-Privett, Inc., (our advertising agency) has extended us throughout the year. I think it is only fair to tell you that I believe their untiring efforts on our behalf have resulted in our obtaining benefits far in excess of the actual monetary consideration budgeted by the Board for advertising purposes. For the amount available to us I think I am quite safe in saying that we have received far more in advertising and publicity than has been the case with other groups known personally to me who have spent substantially more than we have."

R. L. Hartman, beekeeper, stated, "The Honey Advisory Board has at last unlocked the door that can lead to stability and success for the honey industry. If the industry throughout the nation will join us we can open the door to a new economic era for the honey industry. The food of kings since the beginning of time will become the food for all the people for all time through advertising."

H. J. Crawford, beekeeper, says, "It would be impossible to collect 5c per can by voluntary contribution. However, the producers do not complain when it is taken out of their check. I have personally had no complaints."

Albert Morales, honey dealer, states, "I believe that you folks are doing a wonderful job with the limited amount of money that has been made available to you. I hope that in the future you will have more funds to work with as I am sure that you will be able to do a bigger and better job when more funds are available."

Dorwin L. Baker, packer, said, "It has come to my attention that in view of the stronger marketing position of honey and the scarcity of available supplies, particularly of the choicer bottling grades, many honey packers are increasing their selling prices. I believe that such a move is well founded and reflects, in some degree at least, the benefits derived from the activities of the California Honey Advisory Board. In my opinion, the California advertising pro-

gram was very ably directed and handled; and where the distributors followed through, greatly increased sales resulted. I firmly believe that some of my outlets that tied in with this program fully doubled their normal honey sales for a three month period, and that their sales of the year may well be 30% to 50% great-

er than formerly. I think this year's advertising was very effective, and I have nothing but praise for the very capable people who conceived and directed this program."

Ray Reed, chairman of the Honey Advisory Board, sums it all up when he says, "California honey advertising pays off."



A. Z. Abushady

From Harold L. Kelly of the Maryland Beekeepers' Association we learn of the death of Dr. A. Z. Abushady at his home in Washington. He was a noted Egyptian poet, philosopher and a student of Islamic culture. Since 1949 he has been a literary commentator on the Voice of America. Born in Cairo and educated in Egypt, he obtained his degree in medicine from London University and later became professor of bacteriology and vice dean of the medical faculty at Alexandria University. He was founder of the "Bee World" and the Apis Club; also founder of the Bee Kingdom League and of its publication, "The Bee Kingdom". He was an international leader in the standardization of beekeeping equipment and in the improvement of races of bees. He was the author of "Races of Bees" in "The Hive and the Honeybee."



Barbara Roberts at Fifteen

S. J. Head, Crossett, Arkansas, sends this picture of Barbara Roberts, West Crossett. Barbara's mother, Mrs. S. A. Roberts, is a registered nurse and she raised her daughter scientifically on a diet containing honey. Dr. W. L. Smith (now deceased) was the family doctor and prescribed honey for the baby at an early age. She has always been very healthy and her mother believes the use of pure foods like honey is one of the main reasons for her well being. She says honey is not irritating to a young stomach like corn sirups are. Here is the formula she used for the fifth month:

13 ounces of evaporated milk  
19 ounces of boiled water  
3 tablespoonfuls of honey

## A Method of Rearing Honey Bee Larvae

In the February, 1955, issue of the Journal of Economic Entomology, A. S. Michael and M. Abramovitz, of the Entomology Research Branch, Agricultural Research Service, U. S. Department of Agriculture, describe a method of rearing honey bee larvae under controlled laboratory conditions.

A pad of absorbent cotton approximately  $\frac{1}{4}$  inch thick, saturated with a water solution containing 25 per cent honey and 10 per cent dehydrated yeast extract, was placed in the bottom of a petri dish and covered with a piece of 12-mesh, 15-gauge plastic screening. The larvae

rest upon the screening and feed through the openings. When the larvae cease feeding, they are placed in petri dishes containing a thin layer of beeswax, where they spin a pad of silk, pupate normally and emerge as adults.

Thus the complete development cycle from larvae 3 days old to the adult bee is made available for experimental observation. By utilizing this method, disease or development studies can be made in a continuous manner on a daily or hourly basis. For example, European foulbrood can be studied by utilizing the last portion of the larval cycle.

## Honey Helps Hillary Climb Mt. Everest

A recent issue of Sports College News, published monthly by Sports College, P. O. Box 99, Toronto 1, Ontario, Canada, contained the following story, which carried the above title. We are glad to give Sports College full credit for this story and urge United States beekeepers to subscribe to this publication.

Sir Edmund Hillary, conqueror of Mt. Everest—one of the greatest feats of sustained energy and endurance ever recorded—owes his great energy to the honey he was reared on. According to reports from his home in New Zealand, both Hillary and Tensing (his Serpa companion on the famous climb) carried honey candy with them.

This candy was made from powdered mint, liquid honey and dried skim milk. This combination is sound nutritionally, as mint is a digestive, honey an ideal energy fuel and skim milk powder an excellent source of protein, needed to sustain energy. The Hillary honey candy has been tried by Sports College and has found it tasty, easy to digest, and a grand source of energy. It makes an ideal between-effort energy jack-up and is also useful as part of the pregame meal.

The recipe for this honey energy mixture is as follows:

Fine mint powder  
Equal amount of liquid honey  
Mix well  
Add dry skim milk to make stiff paste  
Sprinkle pan with milk powder  
Lay stiffened paste on pan and leave for 24 hours  
Cut into small pieces, roll again in dried skim milk powder and store in airtight jar  
This mixture will keep for months.

## How to Make Use Of Swarm Vigor

If it is desired to make use of the vigor with which a newly hived swarm works the colony should be wintered in one body. The bees are simply left alone and they will swarm during the dandelion flow. The prime swarm when caught should be placed on the old stand the old hive being placed in a new location. When supersedure has taken place in the old hive it is united with the swarm on the old stand.

Julius Lysne, Stockholm, Wis.

# Supering . . . Before, Not After

by G. H. Cale

ONE of the commonest errors in supering for the flow is to delay giving supers until the flow has begun. A prevalent advice about supering in the production of extracted honey is to "give the supers when the bees begin to whiten the combs in the brood nest." When white wax is added to the top edges of the brood combs it comes from newly secreted wax scales, more or less voluntarily produced by the bees, and added to the old comb because new honey is being stored along the top edges. In other words the honeyflow is underway and supers should have been on the hives before this whitening appeared.

A better measure of when to give colonies the first extracting supers is by bloom appearance rather than comb whitening. When the first flowers of clover can be noted generally it will seldom be over ten days or two weeks before nectar is in sufficient volume to say that the honeyflow has begun. Put the extracting supers on therefore when the first general scattered bloom appears. This is particularly true of the clovers.

It should also be considered that the supers are not only used for the storage of ripe honey but also for the storage of nectar. During the first of the flow, and up to the time the nectar yield reaches its peak, probably more comb space is needed for nectar than for ripened honey. In some flows it takes several extracting supers to accommodate nectar. If the nectar is crowded into the brood combs there will be little room for the continuation of brood rearing and, as a result, the bees will not have enough replacements from new bees, because of the restricted brood activity, to maintain the field force and the field work will fall off. This affects the crop and there will be less honey obtained.

As the flow advances, however, conditions may begin to reverse and

there will be less super room needed for nectar than there will be for ripened honey. Those who add required supers in the production of extracted honey at the top, as we do, are often fooled in judging the need for more super room because there may be plenty of comb space in the lower supers of the stack. The most active place for honey storing is at the top and when we see the bees there sealing the combs and apparently occupying all the space we feel the urge to add another super. However, since the flow has begun to wane there is likely to be enough room lower in the stack that really should be filled up to reduce the cost of handling a lot of unnecessary combs in extracting. Also a good full stack of well sealed supers will make sure that the winter food chamber at the top of the brood nest is also well filled.

So supers must be so managed as to give all the room for storage needed but not too much. The early flow is when super room is most in demand and the late flow is when it is in least demand. We have been guilty many times, in extracted honey production, of giving supers enough for two hundred pounds when the actual crop per colony was only 150 pounds or less. So we had to handle at least two more supers in harvesting than we should and we had light food chambers for winter.

It would be nice if we knew what the honeyflow would amount to so we could put all the supers each colony may need on at one time. Some say that they give their supers in definite numbers to each colony and let it go at that until the flow is over. This is a way to release time for other work, to be sure, but it is also a makeshift. If supers are too few honey is lost; if too many, colonies may be light below and a lot of extra work is required in handling the crop.

# Nectar Secretion

by R. W. Shuel

R. W. Shuel is with the Department of Apiculture at the Ontario Agricultural College, Guelph, Canada, working primarily on the physiology of nectar secretion. He was born in Windsor, Ontario, and secured his B.S.A. degree, also at the Ontario Agricultural College in 1941. From 1942 to 1946 he was an artillery officer in the Canadian Army in Italy and other parts of Europe. Returning to O.A.C. and specializing in agronomy, he later received his M.S.A. degree from the University of Toronto in 1948. He secured his doctor's degree in Botany at Ohio State University in 1950 and while there he was on a fellowship for research in nectar secretion for the Division of Forage Crops and Diseases of the United States Department of Agriculture. He has a number of publications on nectar secretion.



**N**ECTAR is basically a solution of sugars in water, secreted by certain plants from specialized structures called nectaries. It may be produced in great abundance, as in *Protea*, the South African "sugar bush," whose flowers contain such an abundance of nectar that they were once used as a source of sugar by humans (Howes, 1945), or it may be secreted in amounts too small to be detected by the human taste. Nectar secretion occurs in a large number of plants representative of many families (Howes, 1945; Lovell, 1926; Pellett, 1947). In this recent book "Plants and Beekeeping" Howes has listed more than 400 species, belonging to 60-odd families, which are of significance as honey sources in England. Six families appear to be outstanding, accounting for more than 200 species of English honey plants. These are: ROSACEAE (the Rose family, in which are included most temperate zone domestic bush and tree fruits); LEGUMINOSAE (the Legume family, comprising the clovers and vetches); LABIATAE (the mint family); SCROPHULARIACEAE (the Figwort family, including figwort and toad-flax); CRUCIFERAE (the mustard family, including turnips, mustard

and cabbage); and COMPOSITAE (the Composites, which include sunflower, burdock, aster, chicory, the thistles, and so on). Size and growth habit appear to be unimportant from the standpoint of nectar production; abundant secretion occurs in such diversified forms as heather, the tiny white Dutch clover, and trees like basswood and tulip tree.

There is considerable diversity in the structure and location of the nectary. Extra-floral nectaries are found on the leaves of broad bean (*Vicia faba*), cotton (*Gossypium* spp.), the castor oil plant (*Ricinus communis*), the cherry laurel (*Prunus laurocerasus*) and many other species. Floral nectaries, the more common type, may occur on the receptacle of the flower, as in apples and pears; at the base of the ovary, as in snapdragon (*Antirrhinum majus*) or the apex of the ovary, as in hyacinth (*Hyacinthus orientalis*); on the sepals, as in basswood (*Tilia* spp.); on petals, as in mullein (*Verbascum* spp.) and the tulip tree (*Liriodendron*); on stamens, as in flax (*Linum ussitatissimum*); and in petals modified to spurs, as in the garden nasturtium (*Tropaeolum* spp.). They may be elaborate or-

gans or merely a simple group of cells.

There is also considerable variation in nectar composition. Sucrose (cane sugar), glucose (corn sugar), and fructose (fruit sugar) have been found in most samples of nectar analyzed to date. (Bailey et al., 1954; Wykes, 1952.) In recent years the development of a new technique of chemical analysis known as filter paper chromatography has permitted examination of very small samples of nectar. With this technique Dr. Wykes, of Rothamsted, England, has identified three additional sugars, maltose, melibiose, and raffinose in some nectar samples. The proportions in which the various sugars are present seem to be characteristic of the plant species. Dr. Wykes believes that this variation may affect the attractiveness of the nectar to the honey bee, as she has found that bees have marked preferences for certain combinations of sugars in solution. A mixture of equal parts of sucrose, glucose, and fructose is most attractive, but the addition of maltose to the mixture greatly reduces the acceptance of the sugar solution by the bees. The relative amounts of glucose and fructose are important

in their influence on honey granulation. A high glucose: fructose ratio favors granulation (Dyce, 1931).

In addition to sugars, nectars contain small amounts of various minerals, dextrins, enzymes, essential oils, and other substances (Beutler, 1954). The essential oils are volatile organic substances which impart a characteristic aroma and taste to the nectar and the honey produced from it.

#### Nectar Secretion in the Agricultural Economy

The secretion of nectar is of course an important factor in the economy of the beekeeper, as his livelihood is provided by the surplus honey made by the honey bee from nectar. The activities of the bee as a honey producer are far surpassed in importance by her services as a pollinator, however, when the agricultural picture is viewed as a whole. Although bees work many plants for pollen and in so doing effect pollination, it is more often the nectar in which the honey bee and other insect pollinators are interested. The floral parts of many flowers are so constructed that the nectar gatherer of necessity rubs against the anthers and picks up pollen while seeking nectar. Some of the pollen eventually comes in contact with the stigmas of other flowers of the same species, and pollination is accomplished. The customary behaviour of the honey bee in confining her foraging to one or a few species greatly increases the chances of pollen reaching a flower which it can fertilize.

The role of honey bees in pollination has been described in detail by Vansell and Griggs (1952), and that of other pollinating insects by Bohart (1952). The list of important crop plants dependent on insects for pollination is impressive. There are such legumes as alfalfa, red clover, sweet clover (some strains), alsike, Ladino, crimson clover (for good yields), and birdsfoot trefoil; vegetables such as carrots, radishes, turnips, cabbage, and celery; fruits such as cucumbers, cantaloup, most varieties of apples (for good fruit production), sweet cherries, pears, plums, almonds, and many others.

#### Nectar in the Economy of the Honey Bee

Except for a few minor incidental sources such as honeydew, the bee is dependent on nectar for the carbohydrate portion of its diet, and hence nectar is of prime importance in the economy of the bee.

#### Nectar Secretion in the Economy of the Plant

Nectar secretion is of no apparent importance to the individual plant. Many plants secrete no nectar; others secrete it sporadically or in insignificant amounts. As far as the individual is concerned, nectar is probably no more than a waste product. It is a different story, however, when one considers the species rather than the individual. The relationship which exists between insect-pollinated plants and pollinating insects—the insect distributes pollen in the course of foraging for food—is in the majority of cases built around nectar. This relationship is believed to have developed in prehistoric times and to have contributed greatly to the evolution and survival of many plants as we know them today. An interesting discussion of this question may be found in Dr. C. G. Butler's recent book "The World of the Honeybee."

#### How Internal Conditions in the Plant Affect Nectar Secretion

To be appreciated, nectar secretion must be viewed in its proper perspective of a process of brief duration occurring late in the life cycle of the plant. Everything that has happened to the plant prior to this time will in greater or lesser degree affect the amount of nectar produced. We should therefore expect to find that secretion is a complex process, and that there is much about it that is variable and unpredictable. Such is indeed the case. The results of recent investigations (Agthe, 1951; Frey-Wyssling et al, 1954; Zimmermann, 1953), beyond the scope of review in this article, but available in condensed form in Apicultural Abstracts in the Bee World, indicate that nectar secretion is far more complicated than was once believed.

At present we know very little about the driving force behind secretion, but we do have considerable information on conditions favorable to secretion. It is quite certain that a necessary condition for good secretion is an abundant supply in the plant of the substance or substances from which the nectar is derived (Shuel, 1955; Wykes, 1952 a). This

substance appears to be some form of carbohydrate as a rule, probably a sugar in such herbaceous plants as alsike clover and snapdragon (Shuel, 1955), and a starch or starch-like substance in nectar trees such as eucalyptus (MacLachlan, 1940). This supply is constantly being built up (in daylight hours) and broken down. It is built up through **photosynthesis**, the process in which the energy of sunlight is trapped by green plants and stored as potential chemical energy in the form of sugars and related substances. The raw materials from which the sugar is made are carbon dioxide and water. The sugar produced by photosynthesis suffers various fates. Part of it is used in growth and the synthesis of proteins, cellulose, and other substances making up the plant body; part of it is converted to starch and other storage forms; some finds its way into nectar, and some is broken down by a process known as **respiration**. Respiration is like a reversal of photosynthesis, in that sugars are converted back to their original components, carbon dioxide and water, and energy is released. Some of this energy is used as power for the vital processes constantly going on in the plant cell; energy is as necessary for the operation of the cell as it is for the operation of an automobile. Much energy cannot be utilized by the plant, but is lost as heat.

It is highly probable that any factor which alters the rate of build-up or breakdown of the carbohydrate supply will influence nectar secretion. Plants making extremely rapid vegetative growth, for instance, often secrete poorly (Ryle, 1954; Shuel, 1955). It is likely that in such instances sugars which might otherwise go into nectar are used in growth. Excessively high rates of respiration will likewise reduce the size of the sugar stockpile, dissipating it as heat energy.

#### External Influences on Internal Conditions

The type of plant into which a germinating seed develops is the result of the interaction of two general groups of factors, the hereditary and

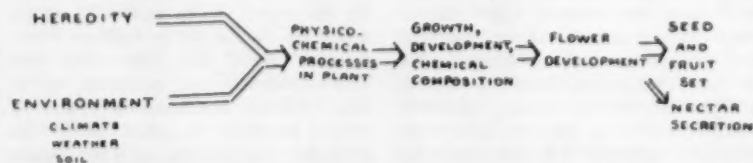


Figure 1. The Influence of Heredity and Environment on the Development of a Plant.

the environmental. Its hereditary constitution, or inheritance from its parents, imposes limits on the size it can attain, the number of flowers it can bear, the amount of nectar it can produce. As soon as the seed begins to germinate, environmental influences come into play and modify the type of plant into which the seed actually develops. Air and soil temperatures, soil fertility, the amount of water available to the roots, the length of day, the amount of sunlight reaching the plant, and many other factors will play a part in shaping the future of the plant. The chain of events resulting from the interplay of hereditary and environmental influences is illustrated roughly in Figure 1.

We may now consider the effect of the plant's environment on nectar secretion. Our knowledge of the long range effects is limited by their complexity. We can generalize to the extent of saying that an environment which favors the development of a vigorous plant with a good crop of flowers may be expected to set the stage for a good nectar harvest. (As mentioned earlier, however, excessively luxuriant growth is likely to be accompanied by poor nectar yields.) Conditions during the growing season which result in poor growth—such as adverse temperatures or a deficiency of soil water or mineral elements—are not likely to herald a large honey crop.

#### Sunlight

Of the weather factors, sunlight is of prime importance. Numerous observers have noted that sunny weather during flowering is favorable to high nectar production and good hive gains. Figure 2 illustrates the relationship between sunlight and nectar production in alsike clover grown in a greenhouse under controlled conditions of temperature and fertility (Shuel, 1955). The black dots indicate the total energy content of the sunlight reaching the plants in the 24-hour period preceding the harvesting of the flowers. This energy content depends on both the brilliance of the light and its duration. The circles represent the average daily nectar yield per head of alsike. It is readily apparent that the pattern of nectar yielded followed that of sunshine very closely. On the day of the most sunshine more than twice as much nectar was secreted as on the day of the least sunshine. The reason for this relationship is not difficult to find. Inasmuch as nectar sugars are products of photosynthesis, and photosynthesis is dependent on the energy of the sun, the patterns found in Figure 2 are to be expected.

#### Air Temperature

The effect of air temperature on nectar production is a difficult one to assess, as temperature also affects many plant processes which are proceeding at the same time. To

begin with, a certain threshold temperature is necessary if secretion is to take place at all. This minimum temperature is not the same for all species. In basswood (*Tilia americana*) growing in northern Indiana, for instance, it appears to be around 64°F. (Demuth, 1923). Heather in Scotland is said to secrete nectar at temperatures below the minimum necessary for bee flight (Howes, 1945). The reason for this direct effect of temperature on secretion is not known, but it may be through enzymatic chemical processes which are thought to supply the energy for secretion.

There is much disagreement as to the effect of temperature variation on the rate of nectar secretion (Beutler, 1954). According to some observers, rising temperatures are accompanied by a diminished nectar flow; other investigators have reported better secretion at high temperatures. It is probable that both are right, and that there is an optimal or most favorable temperature range which is not the same for all species of plants.

Within normal everyday limits, temperature variation probably has little influence on the amount of sugar which the plant synthesizes, but it has a very marked effect on the rate at which the sugar is used up in growth, respiration, and other processes. Extremely high temperatures cause an excessive "burning" of sugars in respiration and their loss as heat. At the same time, flower development is accelerated at high temperatures and the duration of secretory activity is probably shortened. It may possibly be more rapid while it does last, however. At any rate, it is understandable that the net effect of temperature on secretion is hard to pin down, as it will depend on the balance among a number of separate temperature effects.

The belief has been held that an alternation of high day temperatures with low night temperatures is the best temperature pattern for nectar production. It is true that good hive gains are often made during weather of this type. It should be borne in mind, however, that a wide differential between day and night temperatures is characteristic of fine sunny weather, and that the good hive gains may be due partly to other weather effects on sugar production and bee flight. There is as yet no direct evidence that such temperature variation is generally beneficial to nectar production. In view of the

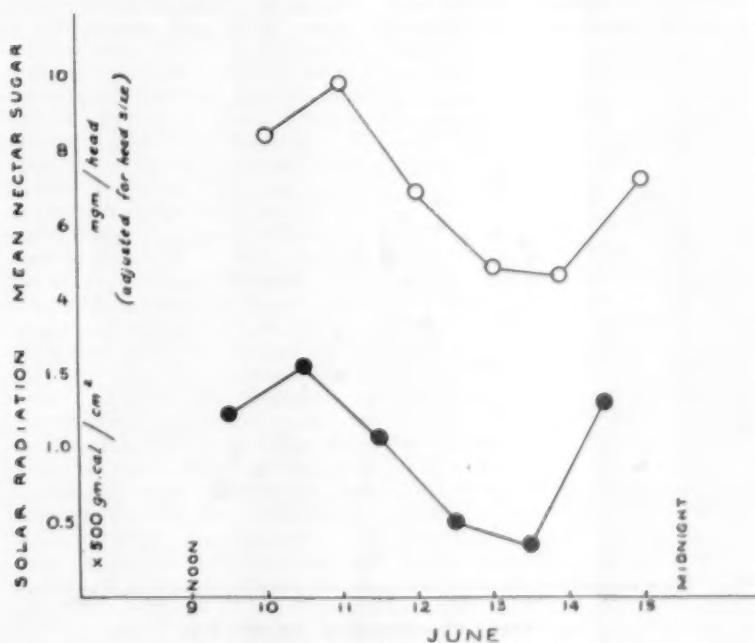


Figure 2. Variation in Nectar Yield of Alsike with Sunlight.

wide differences in optimum growth temperatures for various species, we should not expect to find the best temperature range to be the same for all species.

#### Soil Conditions

Johnson (1946) has reported that in New Zealand white clover consistently yields more nectar on light sandy soils than on heavy clay soils, except in drought years. In times of abundant rainfall, the lighter soil would be better drained and hence warmer and better aerated. Shuel and Shivas (1953) found that the physical state of the soil at the time of flowering had some influence on nectar flow. Low soil temperatures, in particular, caused a drop in nectar yield. Yields were also poor in soil in which a serious shortage of water existed.

Much attention has been given to the relationship of soil fertility to nectar yield, and many conflicting reports have been made. Nectar production has in some cases been improved by the addition of fertilizers, in other cases it has been diminished, in still other instances no response to fertilizer has been noted. Much of the apparent contradiction stems from lack of exact information about the fertility of the soil before the addition of the fertilizer. If the fertility status of the soil was originally favorable to nectar secretion, the addition of fertilizer would hardly be expected to cause much improvement. The results of some experiments carried out under well-controlled conditions indicate that the so-called major elements, nitrogen, phosphorus, and potassium, which are commonly found in commercial fertilizers, may sometimes have an important effect on nectar yield. Miss Ryle carried out nitrogen, phosphate, and potash nutrition experiments at Rothamsted, England, on apples, mustard, buckwheat, and red clover. She found, in general, that fertilizer combinations which promoted the best vegetative growth did not usually give the best nectar yields; in some instances the higher fertilizer levels reduced nectar yields (Ryle, 1954). We have had similar results at the Ontario Agricultural College. In a study in which nitrogen, phosphorus, and potassium were supplied to snapdragons at two levels, nectar yield was found to be lower in the presence of the higher level of each element. The combination of the three elements at their lower level produced less growth, but nearly 70 per cent

more nectar than the fertilizer combination in which all three elements occurred at the higher level. Compared with nectar differences, growth differences were rather minor (Shuel, 1954).

Obviously, much work remains to be done before the picture of soil fertility and nectar production is complete. The evidence discussed above does suggest, however, that further work should be both interesting and profitable.

#### Atmospheric Humidity

**Humidity** is a general term used to express the condition of the atmosphere with respect to water in the vapor form. **Absolute humidity** denotes the amount of water vapor actually present and is usually expressed in terms of the pressure which the water vapor exerts. A more familiar term, **relative humidity**, is used to indicate the percentage saturation of the atmosphere with water vapor. Relative humidity depends on both absolute humidity and temperature. For example, the water vapor pressure necessary for a condition of 100 per cent relative humidity is about five times as high for a temperature of 100°F. as for a temperature of 50°F.

A direct effect of atmospheric humidity on secretion has not been established. We do know, however, that humidity may affect plant growth. A prolonged period of excessively low humidity, coupled with a dry soil, will result in a stunting of

plant growth and consequently a poor nectar crop.

Sugar concentration of nectar, on the other hand, is closely related to atmospheric humidity. Nectar is more highly concentrated in air of low humidity (Park, 1929; Scullen, 1942; Shuel, 1952). Once nectar has moved to the outside of the nectary and is exposed to the air, its water content is subject to regulation until it reaches an equilibrium with the humidity of the atmosphere. This regulation is effected through movement of water vapor out of or into the nectar. The amount of water in the nectar when equilibrium is reached will depend on the humidity of the air and the composition of the nectar. Usually it is a loss of water from the nectar to the air that is involved, as freshly secreted nectar is generally quite dilute (in the range of about 5 to 25 per cent in species so far studied) (Agthe, 1951; Shuel, 1954). The drier the air the more rapid will be the evaporation of water from the nectar. The relationship between atmospheric humidity and concentration of nectar in heads of red clover in a greenhouse is shown in Figure 3 (Shuel, 1952). The nectar was collected each morning at 8 A. M. During the previous night the temperature was held constant at 70°F., so that variations in relative humidity were due only to the changes in atmospheric humidity. Each dot in the diagram represents average nectar concentration in a sample of ten clover heads. It is quite evident that as

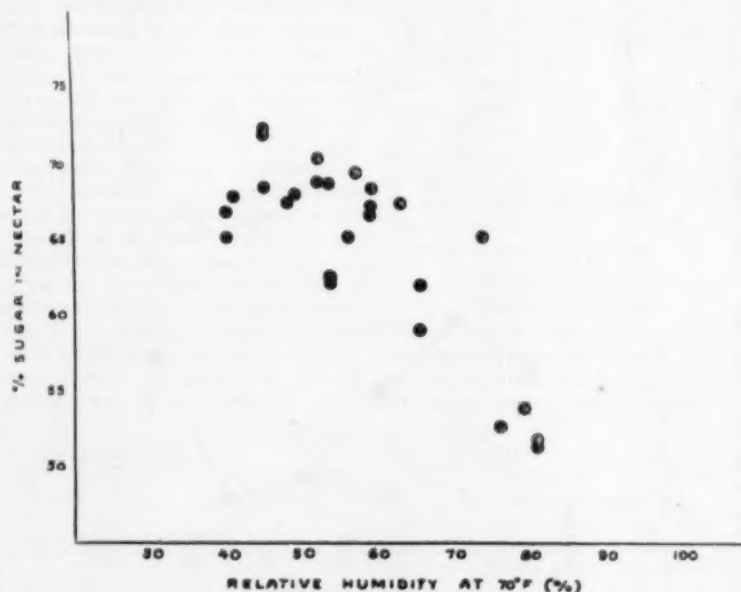


Figure 3. Variation in Concentration of Red Clover Nectar with Humidity.

humidity increased the nectar became more dilute.

The rate at which water is evaporated depends on a number of factors. Evaporation is hastened by high temperatures and rapid air movement across the nectaries. Nectar which is freely exposed, as in sweet cherry or pear, will be concentrated more quickly than nectar which is more protected. Evaporation is more rapid from a thin film of nectar than from a large globule; the nectar in flowers which secrete minute amounts is usually highly concentrated.

#### Precipitation and Soil Water

The amount of water available to the plant root system depends on the amount supplied by precipitation and the amount lost in run-off, drainage, and other ways. Throughout the growing season, water is an important factor in the regulation of plant growth. Either a shortage or an overabundance of water may stunt plant growth and lead to poor nectar yields. During the secretory period a lack of water may reduce the amount of sugar synthesized. The large hive gains frequently observed in good weather following a rain may indicate that prior to the rain a lack of water was limiting photosynthesis and hence the amount of sugar available for secretion. On the other hand, continued rainfall during the flowering period is accompanied by limited photosynthesis and poor nectar yields.

#### Altitude

It has been pointed out that plants growing in alpine regions secrete nectar more copiously than the same species growing at lesser altitudes (Bonnier, 1878; Tschudin, 1921). In statistics on honey production in the French Pyrenees, cited by Ernest Tschudin, average colony gains were three times as great at altitudes of 4000 to 5000 feet as they were between sea level and 1000 feet. The vegetative growth of alpine plants is greatly reduced as a result of conditions of intense sunlight during the day and low temperatures at night, while flower production is conspicuously good. The same conditions of sunlight and temperature favor the accumulation of sugars in the plant. It is probably the combination of a high rate of build-up of sugars through photosynthesis and their low rate of destruction through respiration that is chiefly responsible for superior nectar yields, though other factors may be involved as well.

#### Hereditary Factors and Nectar Production

The question of variation in hereditary potentialities for nectar production is of especial interest to plant breeders engaged in legume breeding. Red clover, for example, is almost completely self-sterile and must therefore be cross-pollinated if seed production is to be realized. The flower tube in red clover is comparatively long (on the average about 9.6 mm, or 0.38 inches) and often the nectar does not rise high enough in the tube to be available to the honey bee. To be reached by the average bee, the nectar must rise to a height of at least 1.7 mm. Apparently the bee can extract all of the nectar if she can reach the surface of it, thanks to capillary movement of the nectar up the side of the flower tube. Collection of nectar from red clover is therefore an all or nothing affair (Howes, 1945). The improvement of red clover pollination through the development of strains which secrete enough nectar to attract the honey bee is an interesting possibility. It has been found (Pedersen, 1951; Ryle, 1954) that considerable hereditary variation exists with respect to nectar yielding ability. Florets of Miss Ryle's highest yielding strain of red clover contained, on the average, five times as much nectar as the poorest nectar strain.

Little is known about the inheritance of nectar yielding capacity. It does appear, though, that many genetic factors are involved (Pedersen, 1951). Any factor conditioning the photosynthetic efficiency of the plant, or the efficiency of the sugar transport system to the flower, would certainly affect nectar production.

#### The Prospects for Improving Nectar Yield

Knowledge gained from studies of nectar secretion will eventually be put to practical use in increasing nectar production in bee pastures and in fruit and seed crops where poor nectar yields are at present limiting pollination. It is interesting to speculate on the degree of improvement which we might expect.

It is not uncommon to notice in a field of clover the occasional plant which is fairly brimming over with nectar and surrounded by bees. It would be very profitable indeed to raise all bee plants to a similar level of production, but such an achievement would probably be an economic impossibility, as yields of this order

must be close to the maximum yield under the best of conditions. The chances of making a substantial improvement in the general average—perhaps of the order of 50 to 100 per cent—are good, however. There are two general avenues of approach:

- (1) Through breeding and selection for plants with a high potential nectar production. The results of Miss Ryle and others point to the existence of wide heredity differences in nectar yielding ability in cross-pollinated crops. A programme of nectar improvement through breeding would result in a higher percentage of good nectar yielders in a field and a lower percentage of poor nectar yielders.
- (2) By cultural means, including the provision of good conditions of soil drainage and the use of fertilizers favoring high nectar production. This approach, too, shows promise.

There is of course no way of controlling the weather. By using good honey plants and providing them with favorable soil conditions, however, we could take advantage of good weather when it does prevail.

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# How to Get a Good Crop of Choice Sourwood Honey

by A. R. Black

Methods of securing a crop of sourwood honey when not living where it is produced (in the mountains of Georgia, North Carolina, South Carolina, Tennessee and Virginia).

Dr. Black is a dentist in Charlotte and one of those thousands of enthusiastic sideline beekeepers who actually are the life of the industry.



**W**E migratory beekeepers who live in the Piedmont section of Carolina have less trouble getting a crop of sourwood honey than the people who live in the mountains at higher altitude. Because of cold damp weather there *Nosema* is very bad. Also the bees never have a chance to cure out aster honey due to early cold falls, and dysentery is bad in winter and spring.

The mountain people object to having the people of the Piedmont section of Carolina moving their bees to the mountains to secure this choice nectar. As many as 99 out of 100 colonies have been destroyed with gas in some places because of this resentment. Often when bees are moved into a territory and gather a nice crop of sourwood honey, some unknown person comes in and removes colonies of bees and honey at night. I would suggest that all "foreigners" make arrangements with land owners and give them one third of the crop.

To secure this crop of wonderful light to amber sourwood honey that retails for 75c to \$1.00, and never granulates is quite a hobby for me,

and each year that I do it I enjoy it very much.

To start with I am a small beekeeper having only 25 to 30 colonies which I have kept from the dark days of 1929 and 1930, trying to read all the bee journals and use all my skill and knowledge to make each colony of bees produce like we would like a choice baseball team to play.

Bees are supposed to start raising brood all over the United States at about the same time, (excluding Florida, Texas and California) about the first week in January. I sure do disagree with this theory. It is the strain of bees you have that starts early brood raising. Therefore, from selective breeding, you can have bees raising brood in the last days of December or last days of February if you choose. I have been selecting for brood raising for early brood for the past fifteen years, using only one 10-frame chamber with excluder. I can have plenty of bees to gather a crop of honey in Piedmont, Carolina, by the 15th of April from tulip poplar, black locust, persimmon, blackberry, ladino clover, alsike clover, Dutch clover, privet

and ragged robin. This flow of nectar ends about the 10th of June.

I am now able to select my best producing colonies that I will carry to the mountains of western North Carolina, with queens not over one year old or queens that have just been raised from reliable stock, having each queen with clipped wings. I always extract enough of this early honey so I will have new drawn combs to put back. Then the bees don't have to draw combs. I remove all combs in the shallow super except one on either outer side, leaving this with honey so bees will have reserve stores. I now place 8 frames of drawn combs in center of first shallow super, placing another shallow super with drawn combs on top, because it takes this room for the bees. I have broken the colony down from 4 or 5 shallow supers to two. After this I cleat the bottom board, brood chamber, and supers together, using screen wire at entrance and screen wire on top. About dark, when all the bees stop flying the last procedure of closing the entrance is completed. Bees are loaded and in about two hours we are at our new location. But we don't un-

load the bees until the next morning. In a few minutes after opening the entrance, the bees are bringing in pollen, water and nectar.

The bees are left on this location about six to seven weeks, usually making one to two trips to see how they are progressing and examining for queen cells. I believe no more swarming would occur and, having queens clipped, I could do without these trips, but I still have the bee fever and like to examine them.

By using these drawn out combs and plenty of bees, I have been able to get a crop of sourwood honey each year. The sourwood honey is taken off about August 10 when it is all capped fairly well. I have found in sourwood honey you don't have

to be as careful about having it all capped as you do with other types of honey because it does not ferment or granulate easily.

This sourwood honey is placed in 1 lb. and 2½ lb. jars with some extracted honey and some comb. There is always a great demand for it and you don't have to be a salesman to get it on the market.

The bees are now screened and brought back to Piedmont, Carolina. The supers of stores replaced. Each colony should be examined for queens, because for some unknown reason the queen loss in the mountains is very bad. It seems the higher the altitude, the more serious the destruction of queens. I had a friend that carried his bees to the moun-

tains and lost 35 colonies out of about 55. I would like some one's idea about this. Is it due to cold, damp weather, or Nosema? My idea is the bees gather nectar from the mountain laurel or poison ivy. This honey is considered poisonous as it causes vomiting if eaten in quantity. The mountain people say this honey is red in color, and the bees never cap it. They will not let you take the honey off until fairly well capped. There is more mountain laurel at high altitudes and you lose more queens the higher you are up.

I hope someone has gained information by reading this article. I am looking forward to another trip to the mountains.

Charlotte, North Carolina



### HONEY ORANGE MUFFINS

½ cup sifted flour  
½ teaspoon salt  
2 teaspoons baking powder  
½ cup whole wheat flour  
1 egg, well beaten  
¼ cup orange juice

1 teaspoon grated orange rind  
½ cup honey  
3 tablespoons melted shortening  
Sift flour, salt, and baking powder together. Add whole wheat flour and mix thoroughly. Combine egg, orange juice and

rind, honey, and shortening. Add all at once to flour, stirring only enough to dampen all flour. Bake in well-greased muffin pans in moderately hot oven (400° F.) 15 to 20 minutes, or until browned.

American Honey Institute  
Madison, Wisconsin

### Cautions when Using Two Queens

The two queen system is simple to carry out when using the division and re-uniting method but there are several conditions that must be met. The amateur must be able to follow directions and NOT: (1) put the old queen back into the hive on the old stand if she was inadvertently removed with the hive body No. 1, but exchange hives; (2) not unite by putting the hive body with the new queen below but above.

There were several circumstances which complicated the results. Two weeks after separating the hives queen cells were found in both hives (unsealed brood was seen in both hives). There was plenty of space in hive No. 2 and I can only think that these were supersedure cells. They were removed before uniting. Two weeks after uniting there was no unsealed brood and an unopened queen cell found, but no queen. One week later a queen was seen, but still no unsealed brood. This was probably a new queen. No swarming was observed, but it was not impossible. This colony yielded 60 lbs. extracted honey in August which is a very fair yield for this region.

Edmund H. Hamann,  
Riverside, Connecticut



Dr. Duisberg with group at meeting in Northern California. Left to right: Ward Studd, Bureau of Markets, Sacramento; Dr. Herwarth Duisberg, Director of German Institute for Honey Research; Dr. J. E. Eckert, University of Cal.; Kermit Wilson, Manager Cal. Honey Advisory Board; M. H. Schumacher, B-S-H Honey Co., Alhambra; William Yeater, Diamond Match Co., Chico.



Dr. Duisberg and Hans Schumacher, of the Research Committee of the California Honey Advisory Board, at a luncheon of the Foreign Trade Association in Los Angeles.

# German Scientist Studies Honey Production and Processing Methods in California

by Hans Schumacher

**T**HERE is contained in honey a very special, sensitive, active ingredient which is responsible for its being of great benefit to the general health." So stated Dr. Herwarth Duisberg, Director of Western Germany's Institute for Honey Research in Bremen. This is also the justification for a German "Honey Regulation of 1930" prohibiting import of honey in which the diastatic ferments are heavily weakened or spoiled. Because the United States, particularly California, relies a good deal on honey exports, the California Honey Advisory Board in 1953 entered into research work on honey diastase at the Departments of Food Technology and Entomology, University of California at Davis. In order to compare findings with those of honey research in Germany, an invitation was extended to Dr. Herwarth Duisberg, a prominent and learned scientist in Bremen.

Dr. Duisberg was conducted on a tour through the Imperial Valley of

southern California, main production area for alfalfa honey, a type that is leading in export sales. Samples were taken from extracted honey in storage and samples from supers on location to test the influence of sun rays on both. Dr. Duisberg spent several days in northern California, addressing a beekeepers' meeting and gathering samples from northern California production for the same purpose. From February 16 through early March, he was a guest of the University of California for intensive work on honey research with Professor George Marsh, Department of Food Technology and John Eckert, Department of Entomology, and John Schade, graduate assistant.

Dr. Duisberg was full of praise for the excellent cooperation extended him. He acquainted these scientists with the fact that German importers had occasionally encountered honeys from the United States which would not meet German

standards. Since various attempts in the past to find the actual cause of this phenomenon had been made without success, it was important that a satisfactory explanation or solution of the problem be found. Studies made in Germany of the method for diastase determination used in Germany were critically reopened and it was found that the types of starches used in the analysis had quite an influence on the values obtained for diastase. Dr. Duisberg's aim was to standardize the diastase procedures, as well as other analytical methods, so that laboratories both here and in Central Europe will be using uniform testing procedures. If standardized methods of analysis of honeys can be worked out between the German and the U. S. authorities, beekeepers and exporters can determine in advance if their honey would pass German standard of food values. It was felt desirable to make many comparisons.

As a climax of this research work,

combined recommendations by Dr. Duisberg, Professor Marsh, John Schade and Dr. Eckert were made and these, together with a complete history, were combined by these scientists in a report which will be publicized at a later date.

In the evening of Thursday, March 3, a testimonial dinner was given Dr. Herwarth Duisberg by the members of the California Honey Packers and Dealers Association in Los Angeles who took advantage to ask many searching questions in regard to the German methods and found the Doctor exhibiting the most candid approach to the discussion of every phase of this vital and most interesting problem.

The German and central European peoples regard California honey as of outstanding quality, high in nutritional values, and with other help-

ful properties. "Among central European people, honey is held in high nutritional regard," Dr. Duisberg said, "and used therapeutically in a greater variety of ways than in the United States. Because of its bacteriostatic properties, inhibiting in some way, as yet unknown, the growth of bacteria, not unlike the miracle antibiotics, honey is being tested in the treatment of the common cold in a number of German clinics."

Whether or not this can be attributed to the natural high diastase values of honey, or to some other substance with the same degree of heat lability, Dr. Duisberg was not yet ready to say. Of all natural foods, he pointed out, honey ranks high in the content of this starch digesting enzyme, which is a normal ferment of the healthy human pan-

creas. Its action on starch-containing foods, like breads, and cereals, is quite similar to that of one of the salivary enzymes and in fact it helps to complete the digestion of these carbohydrates for use as body energy. In feeding of infants, who seem to lack an efficient mechanism for handling starches early in life, the use of natural honey now is being investigated by eminent pediatric investigators, not only in Europe but in America as well. The German government is, therefore, vitally interested in the diastase content of the honey it imports.

As a result of joint research at the Departments of Food Technology and Entomology, University of California at Davis and the German Institute for Honey Research, scientific studies of this absorbing problem will continue.



## My Honey House

by A. H. Gates

**A** DESCRIPTION of this honey house may be of interest to other small beekeepers. It is strictly a one-man affair, in keeping with all my other bee activities. I am a side-line beekeeper and I normally run seventy-five two-queen colonies. I have been in the business about thirty years.

We are located on one of the state highways, and the honey house is on the same lot as the residence. The

outside measurement of the honey house is 15x36. The inside of the extracting room is 14x14. The honey store room is 13x14. A utility room 14x9.

The extracting room has linoleum on the floor. The walls and ceiling are plasterboard, painted with washable white paint. The room is equipped with kitchen range for heat, oil stove, kitchen sink, cold water and electrically heated hot water. Lots

of electric light and utility outlets. Four frame Lifetime extractor with electric motor, steam uncapping knife, cappings tank, and so on.

The extracting equipment could easily handle much more honey than is required of it, but everything else is strictly on a one-man basis. My capacity is about sixteen supers per day, from apiary to can.

Perhaps I should give an idea of my procedure. Forenoon: return empty supers to hives, load in another sixteen supers, place bee escapes under another sixteen supers. The supers are placed on pallets, and delivered to side of honey house. A ramp is lowered and the honey trucked in. The unloading, raising the ramp and closing the door takes about fifteen minutes. Bees don't have time to start robbing. By the time the honey is unloaded, it is 10:30 A.M.

I do odd jobs around the house, take a nap after lunch, and start extracting about 2 P.M. Am through extracting, heating and straining into cans by 6 P.M. Scrub and clean extracting room after dinner.

The storage room and platform has a capacity of about twelve tons. However there is never that amount in it, as the honey starts moving into the retail channels just as soon as some of it is extracted.

We invite the public, and have a lot of visitors, especially classes from the public school. Our layout must be satisfactory, as the county health officer enjoys bringing his friends in to look it over.

Garfield, Washington

# Traveling With the Lovells . . . The Chaparral

**A**S we drove west from College Station, Texas, the last of June, we noted that the land had been cleared for pasture or crops, and it was not until we neared San Antonio that we came across an unspoiled area. Just outside the town we stopped where low, thorny shrubs extended for miles along a railroad track. Much of central Texas was formerly covered with this dense growth of shrubs and low, stunted trees to which the Spaniards gave the name of chaparral.

At San Antonio we called on that great authority on Texas honey plants, Dr. H. B. Parks. Although badly crippled by rheumatism, he still retains his old fire when discussing his favorite subject. When he described the century plant, he exclaimed "and the bees roar over the flowers." He gave us a preview of what to see in western Texas and described many of the honey plants. Dr. Parks has discovered more new species of plants of value to beekeeping than any other investigator in the Southwest. His book, *Valuable Plants Native to Texas*, was by far the most useful publication on the region.

There are several species of palm trees in the area. In the public square across from the Alamo, cabbage palms were in full bloom and alive with bees. There are also many date palms in the city, and Texans boasted that this was one of the few places in the United States where dates produced fruits.

We now continued our westward drive through an increasingly arid country. Much to our surprise we ran into a rainstorm on the Mexican border at Del Rio. Water ran in the streets in great streams, streets that were lined with tall Washington palms in full bloom. Between showers we photographed the crown of one of these through our telephoto lens.

Turning north we stopped at the home of George Porter at Dilly, one of the many fine beekeepers of the chaparral. Mrs. Porter was very cordial and entertained us until her husband returned. He took us to one of his apiaries on the edge of town which was located in a mass of



Ball catsclaw in bloom. The catsclaws are among the most reliable honey plants of the Southwest. The honey is white and mild flavored.

thorny trees and shrubs. Here he showed us catsclaw, brazil, and mesquite in bloom and described their honeys. Like other Texas beekeepers we met, Mr. Porter knows exactly when each species blooms and where it is most abundant. He also knows the color and flavor of each of their honeys.

We now drove northward to Uvalde, the center of the beekeeping industry in central and western Texas. Here we stopped for dinner at the famous restaurant operated by that pioneer beekeeper, W. L. Victor, Sr. Every table was set with a jar of honey with a dripless lid which patrons were welcome to use on any or all articles of food. His southern fried chicken and hot biscuits and honey were delicious. Luckily we found Mr. Victor at leisure. He conducted us through his honey store rooms where over 300,000 pounds of honey were stacked in 60 pound cans. He presented us with samples of many Texas honeys such as catsclaw, mesquite, white brush, brazil, and kinnikinnik. The honey from catsclaw is white in color with a mild, distinctive flavor. There are several species of catsclaw, some with elongated flower clusters and

others with perfectly round clusters as shown in the photograph. The large curved thorns resemble the claws of a cat and make this one of the most annoying shrubs to the cattlemen.

Mr. Victor moves his bees not only over most of Texas but sometimes as far north as the Dakotas. When parcel post rates were low forty years ago, he used to extract all his honey in the north and ship his queens with a few pounds of bees south each fall. He made more money on the extra honey than the cost of shipping, and his bees were able to winter in Texas on very little stores. Next spring he shipped his queens back and put them on the combs he had saved from the previous fall.

Mr. Victor was particularly enthusiastic about huajillo (pronounced wa-he-yo). He called it the most famous honey plant of the southwest. This shrub occupies a strip 200 miles wide at the north end of Texas and extends southward to the Gulf of Mexico, 300 miles away. The honey is very white with a mild, pleasant flavor. In his store he also features an amber honey which he calls his "brazil blend." This is a fine flavored honey made from such chaparral shrubs as catsclaw, soapbush, huajillo and brazil brush. The honey has a distinctive caramelized flavor which many of his customers have come to prefer to the milder flavors of the white honeys.

Harvey B. Lovell  
Louisville, Kentucky

## Promotion . . .

The general manager of the Special Products Division of National Biscuit Company, Hal N. Chase, says, "Promotion is the portion of marketing wherein we have a chance to use our imagination . . . yet it is alarming to find that all too few of us are merchants and make use of our creative talents. There is such a terrific premium on being unorthodox, on breaking with tradition, and daring to be creative, that it is quite difficult to understand why the great majority of us stick to the traditional, re-use and re-hash the old cliches, and ape others."

Honey producers and honey packers have a unique and high-quality product to sell. Let's give honey a unique and high-quality promotional boost this year by using the professional services of the American Honey Institute, Madison, Wisconsin.

## What about Pollen Substitutes?

by H. J. Rahmlow

**I** JUST finished reading the article "What About Pollen Substitutes?" on page 140. I take issue with it. We have made it a practice to examine brood nests the beginning of February each year since Dr. C. L. Farrar first called attention to the need of maintaining the pollen supply for continuous brood rearing. Here is what we have found:

1. We have never found a normal colony which did not start brood rearing by mid-January and have at least two combs with brood by February 1.

2. The majority of our colonies have exhausted their supply of pollen by late March, even though the yards were in a wooded area. This has been found to be true in all sections of Wisconsin. The pollen supply is consumed by late March in good normal colonies almost every year.

We can prolong the period during which the pollen will be available by adding soybean pollen cakes on top of the combs containing brood during March. We have never yet found a colony without brood or eggs at any time when the soybean flour was given. Bees will raise brood almost normally without pollen when only soybean flour is available for a period of at least one week to 10 days, providing they had sufficient pollen before that time.

Soybean flour is especially valuable during long periods of inclement weather in April and even May, when the pollen supply is used up rapidly due to heavy brood rearing.

3. During March pollen may not be available to the winter-cluster of bees during a prolonged period of real cold weather such as we often have in Wisconsin. During these periods the bees cannot leave the cluster, but if soybean flour is placed on the combs containing brood, the nurse bees can feed on it and maintain brood rearing. When weather turns warm enough the bees will again be able to feed on the pollen in combs near by. We often move combs of pollen next to the brood to make it available during cold weather.

In all cases where normal colonies did not consume soybean flour cakes it was found due to the material not

being close enough to the cluster so the nurse bees could reach it easily in cold weather.

If the cakes are made of  $\frac{1}{4}$  pollen and  $\frac{3}{4}$  soybean flour the bees will consume much more of it than if only soybean flour is used, and consequently will produce more brood.

Soybean flour cakes should not be too "runny" for fear that the material will run down between the combs and kill bees, even the queen. It must be stiff enough to remain on the combs. When we first used the material we had a little trouble in this respect.

At recent beekeepers' meetings reports were given that there was considerable winter loss in some sections, but beekeepers who checked their colonies in February and March and fed those that were short of stores had very little loss. There is still, however, an impression among some beekeepers that mid-winter examination is not advisable. More bees could be saved by checking colonies early than any other one thing we can do. This of course, does not apply to beekeepers who always feed their colonies so well in the fall that they never have any shortage of stores. How many of us are in that class?

Secretary, Wisconsin State  
Horticultural Society,  
Madison

### Tips for Heating Honey . . .

This was the title of a short article appearing in the January issue of *The American Bee Journal* in which Ancel Goolsbey of Utah reported using a lead-sheathed electrical cable for heating liquid honey. The cable had a sheath temperature of not in excess of 165 degrees F.

Due to considerable interest on the part of readers, we sought additional information both from Mr. Goolsbey and from General Electric who manufactured the cable. In this process, it was found out that there might be a possibility of the liquid honey containing amounts of lead that are in excess of the Food and Drug tolerances for lead in fruits (3.57 parts per million). This was brought to our attention by Dr. J. W. White, Jr., Supervisor of the Honey Unit, Biochemical Section of U.S.D.A.'s Agricultural Research Service located at Philadelphia, Pennsylvania.

Consequently, Mr. Goolsbey submitted samples to Dr. White. We are informed that two of the samples

of heated honey did contain amounts of lead in excess of the above tolerance for lead in fruits.

Beekeepers should thus be cautioned in the use of lead sheathed cables for heating liquid honey. Such cables either should be used in such a way that they do not come in direct contact with honey, e.g. wrapped around the outside of honey storage tanks or extractors; or the lead sheathed cable introduced into a copper or other suitable metal pipe which would prevent direct honey contact.

The American Bee Journal apologizes for publishing the original short article without having made sufficient investigation before so doing.

### Ultrasonic Waves and Honey

Science magazine for March 4, 1955 contains a preliminary report on the effect of ultrasonic waves on the crystallization of honey. This work was done by Dr. Socrates A. Kaloyereas at the Louisiana State University Agricultural Experiment Station.

The honey samples were provided by Everett Oertel of the Southern States Bee Culture Laboratory, and a magnetostriction oscillator, made available by V. Williams, was tuned to 9 kcy/sec. The treatment lasted 30 minutes. The samples were examined microscopically immediately after the treatment, and also after storage periods of 1 and 4 weeks at various temperatures from plus 39° C. (102.2° F.) to minus 40° C. (-40° F.), and compared with control samples.

Although crystals of different sizes were found in the control samples, not one of the treated and stored samples showed any. These results are not only important from the practical standpoint of preserving honey (without the usual heat treatment), but have theoretical significance in view of the fact that ultrasonic waves have hitherto been supposed to promote crystallization in general.

A preliminary study also was made on the effect of ultrasonic waves on fermentation of honey, which indicated very few yeast cells in the treated samples as compared with the untreated portion. A more extensive experiment is being undertaken to obtain quantitative data and other possible effects on treated honey.

# Honey and Your Diabetes

No. 3 by D. C. Jarvis, M.D.

**C**ONTINUING this discussion of diabetes mellitus from the viewpoint of Vermont folk medicine let us consider the symptom of this disease. Medical literature tells us that the onset of diabetes mellitus is insidious. It is frequently not discovered until the urine is examined during a life insurance examination.

Let us first consider the frequent passing of urine in large amounts which is a symptom of diabetes mellitus. In Vermont folk medicine this symptom suggests a lack of potassium which has the ability to draw fluid to it. If a child wets the bed at night one teaspoonful of honey at bedtime will usually stop the night bed wetting. This holds true if the child wetting the bed at night has diabetes mellitus and is receiving insulin injections each day.

Next let us consider the symptom of excessive distressing thirst which is more marked an hour or two after meals. If a normal individual takes food rich in potassium at meals he will not develop a thirst sensation between meals. If potassium is taken with salty food there will be no desire for water following the meal due to the fact that the potas-

sium in the honey attracts fluid to itself.

A third symptom of diabetes mellitus is excessive appetite. According to Sherman apple cider vinegar contains potassium which is brought over from the apple. If one teaspoonful of apple cider vinegar for each 100 lbs. of a farm horse's body weight is poured over the ration at each feeding the horse will eat only half the ration. When the apple cider vinegar is omitted the horse will take all the ration. With the apple cider vinegar added to the ration the horse has more strength and greater endurance.

It is the same with dairy cows. When two ounces of apple cider vinegar is poured over the ration of each cow in the herd at each feeding twice a day the cows in the herd will do one of two things. They will increase the production of milk or they will increase the butter fat content of the milk. This is shown by the figures at the creamery where the milk is delivered. At the same time the cows in the herd will eat less ration and less hay as shown by the figures of the herd cow tester. From these observations excessive appetite suggests a lack of potas-

sium in the daily food intake.

Let us consider the fourth symptom which is loss of weight and strength. Loss of weight is looked upon by Vermont folk medicine as due to a lack of potassium. Potassium is responsible for the ease with which food material passes through each body cell wall. When potassium is lacking in our daily food intake because we shun honey, fruits and vegetables it becomes more difficult for food material to enter each body cell with the result that each body cell is hampered in carrying on its vital function of creating heat, energy and carbonic, lactic, phosphoric and sulphuric acids. The cells of the body are starved and we note marked loss of weight.

There are a number of symptoms associated with diabetes mellitus such as itching of the skin, numbness and tingling, visual disturbances, headache and dizziness which may be explained by a lack of potassium.

To Vermont folk medicine the symptoms of diabetes mellitus suggest a need by the body for potassium. Because honey is a good source of potassium Vermont folk medicine prescribes it. It looks on diabetes mellitus as a potassium deficiency disease. Organized medicine does not know the cause of diabetes mellitus. Concentrating on the sugar phase of the disease it advises against the use of honey because it has a sugar content.

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## You Asked for It...

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If you have any questions for which you need an answer, address them to Frank E. McLaughlin, American Bee Journal, Hamilton, Ill. He will give you the answer himself, or he will get you an answer from the best source possible. This service is free.

Edgar Williams, Ohio

I want to know about branding honey with the words "Not less than 12 oz. net weight." Is that correct?

Under the Illinois state law, honey so marked would be misbranded. The correct wording should be "Net weight 12 ozs." or "12 oz. net weight," leaving out the words "not less than."

Years ago our own stamps were

worded, "net wt. not less than 12 oz." or 13 oz., 14 oz., as the case may be. We had to change our stamps to read "net wgt. 12 oz" and so on up to 16 oz. depending upon weight of honey we were packing.

Our state has a closed package law, therefore, comb honey in a cellophane wrapper, window front carton or other enclosure is regarded as a closed package. It is then necessary to place name and address of producer or packer and net weight on each section of comb honey.

Each and every section of honey that we pack for regular trade channels is stamped with our name and address, also net weight.

We sell some comb honey to other beekeepers who want to sell it under their own name, etc., on which we are not required to place our name

or stamp net weight. This responsibility then rests with whoever the beekeeper is.

(Answered by Carl E. Killion, Illinois).

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C. J. Beckley, Ontario

I would like to know the dimensions of the shallow hive like the one used by Dr. C. L. Farrar. I understand this is a shallow, square hive.

The square hive body is identical to the Modified Dadant shallow hive body except its width is equal to its length. Since most factory-cut equipment is made from 25/32-inch lumber cut 19-7/8 inches long, the inside dimensions would be 18-15/16 inches.

It is probable that a depth of 6 1/2 inches or 6-9/16 inches would provide a more suitable bee space between sets of combs than the 6-1/4 inch standard depth rim. The small-

er bee space is adequate for the passage of bees, and there is less tendency for the building of burr comb. The disadvantage of hives cut under 6- $\frac{1}{2}$  inches results from problems of expansion or contraction of the wood. Most of our equipment expanded, necessitating sawing off the bottom edges from  $\frac{1}{8}$  to  $\frac{3}{16}$  of an inch.

(Answered by Dr. C. L. Farrar, Wisconsin).

Aaron G. Baker, New Mexico

Although I have never been without bees in past years, probably I shall now expand about 500 colonies a year. If you have worked bees with the temperature around 100, you know how worn out a fellow can get after looking over 50-75 colonies. Just why can't the brood chamber be kept above the supers just as well as below the supers? Seems to me this would eliminate a lot of senseless lifting.

Everyone, myself included, is always looking for an easier way of doing things. But placing the brood chamber at the top, and the supers at the bottom of a colony of bees just doesn't work out well. For one thing, the bees will travel stain the honey combs, traveling on them to get to the brood chamber. For another thing, bees like to go as far up as they can to store honey. Therefore, the bees would crowd the queen out of a place to lay, and she would go down.

Geo. W. Moore, Georgia

What are the objections to using shallow supers with wired foundation for brood frames instead of hive bodies and full depth frames? I think the advantages to using shallows are: lighter units to handle, placing more or fewer bees above extracting frames and grouping of brood more quickly, that is, small frames will be filled or become empty more quickly.

There is no real objection to using shallow supers for brood rearing, but I never cared for it. Frames in shallow supers are not interchangeable with frames in deep hive bodies and one would have to have all shallows if using that system. Also, the queen does not like to lay in fresh drawn comb but prefers dark comb. The full depth size works best for me; there is room for pollen and stores as well as the brood.

## Pennsylvania Stories

# Backwoods Adventure

by George H. Rea



The kind of old-time road Rea mentions. Weren't those the "good old days?"

**M**Y little "two-lunger" right-hand-drive 1905 Buick car chugged along the muddy deep-rutted road in east central Pennsylvania. Soon after leaving Harrisburg, rain began to fall and continued steadily until nearly night-fall. Only the high wheels of the early automobiles made travel possible over country roads before there were any hard-surfaced roads.

The village squire of a country town back in the hills had written several times for help with his bees. He reported foulbrood infection in his bees and in others in that area. After preparing for a trip of several days, I thought it wise to go up there that afternoon so I would be there in the evening when he would be at home from his duties in the village.

At times it seemed that the little car would never make it through the sticky mud and, because it had no top, I was soon soaking wet. The worst was met on a gently sloping hill where the ruts were deep in heavy clay. When the axles began to drag the motor could no longer move the car, and it stalled. Fortunately, the rain ceased; but night was near, for I had made very poor

time, and now I was worried because the area was heavily wooded and I did not know where help might be found nor how far I was from my destination.

I discovered a stony area on the hillside a short distance from the road. Many loose stones were available, and that gave me an idea. The car did not have a starter but had to be cranked; and a stalled motor, especially one that was hot from heavy pulling, did not start easily. After much cranking and kicking back it started, and I found that I could back the car a few feet in the rut it had made. Small stones were thrown into the ruts in front of the wheels, and to my joy I found that the car could lift itself upon these stones just enough for the axles to clear the harder ground in the center of the road. After investigating the ruts ahead, I thought that if I could work the car through about two or three rods of the worst of this clay area I might be able to go on.

Because I had no means of transporting stones except by hand, considerable time was consumed in partly filling the ruts ahead of the car. It worked, however, and I was soon out of the woods and on top of a hill

with the farm home of the squire but a short distance away. By that time the sky had cleared and the sun came out low on the horizon, but the livid beauty of the sunset in the rolling hill country seemed to make up for all the difficulties of the trip.

Here began one of the strangest experiences in my many years in the field. Expecting me and hearing the motor, he came out of a barn door with a milk pail in each hand. His feet and legs were bare, and his pants legs were rolled up to his knees. He was bareheaded and had a heavy growth of black whiskers and hair that almost covered his ears. His attitude was one of pleasant anticipation of my coming, and he shouted my name as he came rapidly toward the car with the muddy mess of the barnyard oozing between his toes. He greeted me in cultured language with a slight Dutch accent. He proved to be a genial host regardless of what seemed to me to be almost intolerable conditions in which he existed.

He excused himself while he carried the milk into the house and suggested that I might want to enjoy the nice evening air until he would return in a few minutes. I noticed that his bees were in a row of white modern hives along the garden fence back of the house. It was evident that he took pride in his bees, as he did in his well-kept garden and lawn. Twilight was falling when he returned, but we had time to examine one colony which he said was "sick" and he thought might have American foulbrood. This proved to be correct, but conditions were not right to examine the rest of his 20 colonies. He invited me to stay overnight, and I gladly accepted his kind invitation. To stay over in the home was the only thing I could do there and in many back country places in the earlier days.

Before entering the house his countenance changed, and he became a pathetic figure. He wanted to be hospitable to me, but now he assumed an air of hopeless resignation to conditions which he said he could not help. His wife was hopelessly demented and melancholy; but there was an extra bed for me, and if I would please overlook conditions he would be so happy to have me visit with him that evening. My sympathy for him overcame an urgent desire to go on and stay in the woods if necessary.

We entered what seemed to be

their combined living-dining room and kitchen, although I think there was a second room adjoining. She sat in a rocking chair. Her long black hair, streaked with gray, hung in unkempt strings down over her shoulders and the back of the chair. The squire spoke to her gently and told her who I was, but in her blank face and dull eyes there was no evidence of recognition of me. Something was cooking for supper on a big wood stove, and I was directed to a basin and water pail where I could wash up for supper. I refrained, however, from drinking from the commonly-used dipper that hung on a nail on the wall. The towel was clean, and I used it. The supper was simple, consisting of fried potatoes, wheat flapjacks, summer sausage, and coffee, all prepared by the squire. The sausage, as was customary, was kept in the granary buried deeply under the oats where it became highly rancid. It was good food, but the odor in cooking it was something else. The wife ate some supper and at times mumbled incoherently.

That night proved to be pretty much of a nightmare. After a pleasant evening discussing bees and beekeeping with the squire, he lighted my way by the use of a kerosene lamp up a rickety stairs to an unfinished and almost unfurnished attic. The furniture was an unkempt bed, a small stand on which he placed the lamp, and one chair. The floor was bare, rough boards, and the windows were two square holes in the two gable ends of the room. He apologized for the condition of the bed for, he said, a relative of his wife, a woman, had come to visit them and had taken sick and died in the bed the week before. He had not had time to wash the bedclothes, and they had no others. He hoped I would find it all right to sleep in and went downstairs. Well, there was always something in me that made me enjoy adventure, or at least never to run from it. Perhaps having grown up among the wild things in the big woods, then in western Pennsylvania made me respond instinctively to this situation as another adventure.

Happily, it was warm enough to sleep without covers. I removed the quilt, sheets, and pillow case and deposited them on the floor. I thought that by so doing and by resting mostly on my back to prevent my face from contact with the bed, I would be safe from infection.

This I did for what seemed to be a very short time, when I was awakened by the fussing of roosting chickens and the loud crow of a rooster near my head. Arising, I discovered the fowls in the limbs of a large apple tree just outside that porthole in the end of the wall above the bed. I had rested some but had no sleep, because soon after I lay down I discovered mice working in the straw of the tick underneath me. When I would stir slightly the mice would become quiet for a few minutes and would begin again after they thought all danger from me was past.

At daybreak I heard the squire moving about the kitchen, and I was not long in getting into my clothes and joining him. His "good morning" and hoping that I had a good night's rest seemed not to need a reply from me. Breakfast was a repetition of the supper menu, but his wife was not there. I was glad when we had examined his bees that fine sunny morning and I wended my way to other beekeepers that day.

I would like to return there sometime to see what became of the squire and his wife.

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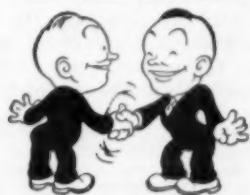
## Canadian Crop Report . . .

The Dominion Bureau of Statistics at Ottawa reports a total honey crop for Canada for 1954 of 19.9 million pounds, or 25 per cent less than 1953. The average for 1943-52 was 34½ million pounds.

Ontario ranks first with six million pounds and Manitoba, Quebec, Alberta, and Saskatchewan follow with six, four, two and one-half and two million pounds respectively. British Columbia produced one million pounds.

In per colony averages Manitoba ranks highest with 112 pounds, British Columbia produced 84 pounds per colony, Saskatchewan 81, Alberta 74, Quebec 65 and Ontario 36 pounds in 1954.

There are 340,000 colonies in the Dominion compared to the 1943-52 average of 487,000. The per colony average for the Dominion was 58 pounds as compared with the ten-year average of 71 pounds and a total average in 1953 of 77 pounds per colony.



#### ABIE STINGS SEZ:

Read in a magazine that you oughta put your supers on just before they are needed. The writer didn't explain just how a feller's supposed to know when that is, so I compromised. I put 'em all on at once. Give 'em plenty of room I always say. If the flow comes along, they'll store it and if the flow don't come along, I can take the supers off just about as easy as I put 'em on.

#### Non-Residents . . .

In his article in "Gleanings" for March, Warren Miller, Director of Plant Industry, describing beekeeping in South Dakota, says: "Approximately half the bees kept in our state are owned by non-resident beekeepers and a further increase is expected for 1955 with numerous requests for yard locations yet to be processed." The larger, commercial operators are always looking around for bonanza locations to get away from places where crops are no longer profitable enough to meet the higher costs of beekeeping today. The smaller beekeeper better stay put and make local surveys for location improvement. It is surprising how often such surveys pay off.

#### Two Queens . . .

In his article in "Gleanings" for March, "Spring Management in the Apiary," Bert Martin says:

"Many attempts have been made in recent years to control swarming and automatically requeen in the same operation by dividing the brood of a colony into two parts by means of a screen or on two bottom boards. The two queens are allowed to lay for a while and then the colony parts are reunited preferably with the young queen remaining. Swarm control and requeening have been two of the bogeys of the business. It will be one of the greatest advances in management in years if methods of accomplishing the above can be perfected and adopted."

#### Cotoneaster . . .

We have 120 Cotoneaster horizontalis nine years old, planted en masse between our house and the road. They are a large, intertangled mass, very pretty at all seasons, a wonderful, long-lasting nectar source with the flow starting early in the day and lasting later in the day than the other garden and field flowers nearby, and for more days. The patch gets weeded only once a year as the cotoneasters beat out all but a few, tall and hardy weeds. No irrigation is required. The soil is poor and has had no fertilizer or other plant food all these years. The cotoneaster berry crop is extremely heavy. Our winters are mild with little snow but the berries are attractive to the "dickeybirds" and a few robins. Years we do have snow the robins move in by the hundreds and strip every berry off. The bushes will be black with robins for several days. They get so tame the children can walk among them.

Mrs. C. Warren,  
Victoria, British Columbia

#### A New Weapon For Killing Flies

The Department of Agriculture and others are giving extensive publicity to a "new weapon for killing flies" which has established a resistance to ordinary insecticides. This is the use of insecticides with dry sugar as a bait.

While proving effective against flies in buildings belonging to dairymen, poultrymen and livestock men, such a practice may present a serious problem to beekeepers. We report this information not as a scare to beekeepers generally but to alert beekeepers to be on the watch for loss of bees from a practice of this kind.

#### Beekeeping in Minnesota . . .

Written by M. H. Haydak "Beekeeping in Minnesota" is a newly revised bulletin. The cover is a picture of former State Apiarist, M. C. Tanquary, at work with a truck in one of his bee yards. It is a splendid reference, particularly for the beginner, telling how to begin with bees, spring management, requeening, colony operation, swarming and swarm control, production, harvesting, wintering, diseases. Copies may be obtained from the Agricultural Extension Service of the University of Minnesota, St. Paul 1, Minn.

#### Nosema Disease —

(Continued from page 225)

tial evidence. White found that the disease disappeared six weeks after colonies were infected by feeding spores in syrup during June, July or August but in early spring or autumn this method of infection killed the colonies.

A source of infection must remain, however, because the disease usually persists at a low level in the autumn and early winter to form the nucleus of the outbreak of disease in the following spring. It has been suggested that there are many sources, for instance, flowers covered with excrement, drifting drones from infected hives, air currents, water and honey. However, if such agencies were significant one would not expect the disease to decline as it does immediately after a period when the flying population is most active and heavily infected and, therefore, most likely to spread the disease. It is most unlikely that honey in the comb is significantly contaminated with spores because defaecation over stores before they are sealed during the summer normally does not occur. Nor do infected bees regurgitate food from the infected midgut into the crop; on the contrary a highly efficient mechanism removes particles even smaller than the spores of *N. apis* from the crop (Bailey, 1952) and the general tendency is, therefore, for infected honey to become decontaminated.

Combs contaminated during the winter seemed the most likely places for traces of infection to survive the summer. The unoccupied combs outside the brood-area seemed the most likely nests of infection because combs in the brood-area itself are cleaned and used repeatedly during the summer.

This hypothesis was confirmed by experiments which included the transfer of colonies entirely onto non-contaminated combs during the early summer when the disease was at its peak (Bailey 1953, 1954, 1955). The disease in these colonies fell at the normal rate during the summer, but then disappeared completely instead of falling to a very low but persistent level, as it did in control colonies. It was also shown that bees could recover stores from contaminated comb during these operations without carrying the disease over to their new combs.

The old comb, including stores of pollen and honey, can be effectively (Please turn the page)

## Italian Queens

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sterilized with acetic acid fumes and then safely returned to the colonies. (Acetic acid used in the same way eliminates wax moth most effectively.)

Here, then, we already had a highly efficient manipulative means of eliminating the disease, but the knowledge is also of value in general management of bees. If a beekeeper can spare neither time nor money to eliminate the disease he now has a knowledge of its nature and can take precautions accordingly. For example it is unwise to place non-sterile comb into colonies late in the season because this can create a heavy infection early in the winter resulting in an acute infection during the following spring. Transporting infected colonies over long distances during the summer causes the excited bees to defecate within the closed hive thus resulting in heavy contamination of combs. This again has an aggravating effect on the disease because a new peak of infection has been artificially created and it does not have time to fall to a low level before the winter arrives (Bailey 1955). The heavy infection of package bees and their queens, as noted by Farrar (1947), is probably caused in this way.

Drugs, such as fumagillin, can also be used more efficiently with the knowledge we now have. Feeding fumagillin in the spring or summer to infected colonies will suppress the infection in the bees but will not eradicate the reservoir of infection on the combs and the disease will recur the following spring. It is much more effective, and convenient, to feed the drug in the autumn (Bailey, 1953) because it then cures the few infected bees and prevents the spread of infection in the winter cluster and the further contamination of the combs. One or two annual autumn treatments of this kind with fumagillin may clear the disease out altogether. However, absolute eradication of the disease cannot be guaranteed unless the combs are changed and sterilized.

Very small numbers of spores, probably only one, are enough to infect a bee (Bailey, 1955). Such a slight infection could result in infection of the whole winter cluster. A few infected bees crushed onto a comb by the beekeeper when changing the combs of infected colonies could be enough to create such a slight infection later in the year, thus jeopardizing the operation. However, feeding with fumagillin during the previous autumn is an

ideal preliminary treatment before comb transference as the bees emerge relatively free from disease in the spring and can then be handled with far less risk of spreading the disease.

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Rothamsted Experimental Station  
Harpenden, Herts  
England

## To Clean Out Supers . . .

To clean out partially filled supers in the fall it is recommended to place them over an inner cover with the hole open. I find that when the hole is fully open the bees will still put nectar from the fall flow in these supers. If the hole is opened only a bee space the super will be cleaned out. This may be because a large opening allows the heat from the hive below to warm the super, whereas a small hole results in a cold super. With less integration the bees may have the impression that they are robbing, getting something for nothing.

Edmund H. Hamann,  
Riverside, Conn.

## Steel Traps for Skunks . . .

Inside of thirty days we have caught six polecats by placing small steel traps in front of our hives without any bait. Just what they are after I can't tell; whether it's honey or bees. I have often wondered why the "critters" are called polecats. Maybe because it would be more sensible to kill them with a long pole rather than to beat them over the head with a stick of stove wood. Outside of bothering the bees they seem to be harmless and go about everything they do backwards. —Mark Gardner, Shawsville, Virginia.

## DRUGS for the Control of Bee Diseases

**SULFATHIAZOLE**—For American Foulbrood. In use for many years with good results. Standard preventive dose,  $\frac{1}{4}$  tsp. in a ten-pound pail of sirup. Inexpensive.

2 ounces — 75 feedings	\$ .96
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10 pounds—6000 feedings	62.75 Net, no discount

**TERRAMYCIN TAF 25**—For the prevention or treatment of European Foulbrood. TAF 25 is entirely soluble, economical. In sirup feed, one gram ( $\frac{1}{4}$  tsp.) to each feeding. For dry use, add powdered sugar to a  $\frac{1}{4}$  tsp. to make a full teaspoonful. Mix thoroughly and dust on tops of brood frames. If disease is present use  $\frac{1}{2}$  tsp. of drug. Three treatments for either prevention or cure are usually enough. About  $2\frac{1}{2}$ c per dose for prevention.

4-oz. bottle, 116 feedings, \$3.90; 1-lb. bottle, 460 feedings, \$11.90;  
10 lbs., 4600 feedings, \$73.90 Net, no discount

**FUMIDIL-B**—For Nosema. This serious disease of adult bees is often unnoticed. In packages may cause loss from supersedure that is serious. Likely cause of common spring dwindling. Colonies fed in fall or spring often make more honey. Packages do well without queen replacement and with little attention. Full directions for use on each bottle.

$\frac{1}{4}$  gram, 5 or 6 feedings, \$2.40;  $\frac{1}{2}$  gram, 100 to 120 feedings, \$28.50; 57 grams, 600 to 700 feedings, \$127.50 Net, no discount

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DEALERS EVERYWHERE

# MEETINGS

## Westchester County

New Rochelle, New York, June 19

The Westchester County Association will hold its first outdoor meeting on Sunday, June 19, at 2:30 p.m. at the home of Mr. and Mrs. Roland Block, 12 Gedney Circle, White Plains, N. Y.

This is an opportunity for all new and prospective beekeepers to see the workings of a hive which will be inspected by our expert beekeepers. Women are also welcome, and a pleasant afternoon is in store for all those who attend. Refreshments will be served by our "Queen Bee Hostess."

Mrs. Alfred Roth—Publicity

## Midwestern Association (Missouri), Gardner, Kansas, June 12

The Midwestern Association will meet June 12 at 2:30 p.m. at the farm home of Mr. and Mrs. William Brite, Gardner, Kansas, 1 mile east and 2 miles south of Gardner. Watch for the signs. An interesting program is planned. Boys of 4-H Beekeeping will demonstrate. Drawing for door prize. Refreshments by the Ladies Auxiliary. Please bring chairs.

Mrs. William Brite, Sec.

## Eastern States Beekeepers Conference

University of Maryland  
College Park, Md., June 16-19  
Thursday, June 16—

Busses and cars make first campus stop at Apiculture Building. Advanced registration, housing arrangements (until 9 p.m.).

6:00 p.m.—Dinner, dining hall.

8:00—Informal social gathering, Apiculture building; host, Maryland State Beekeepers Association.

Friday, June 17—

8:00 a.m.—Registration. Inspection of exhibits.

10:30—Call to assembly, George J. Abrams, Chairman, Apiculturist, Univ. of Md.; invocation, Rev. Nathaniel Acton, St. Andrews Episcopal Church.

10:35—Welcome to University of Maryland, Dr. Wilson H. Elkins, Pres., University of Maryland.

10:45—Welcome to Maryland Free State, Hon. J. Glenn Beall, United States Senate.

11:00—Address, James I. Hambleton, Head, U. S. Bee Culture Lab.

12:00—Lunch, at the apiary.

1:00 p.m.—"The Queen Honeybee," W. J. Nolan, Apiculturist, U. S. Bee Culture Lab.

1:30—"This is New England Beekeeping," J. Gaston LeVitre, Pres., R. I. Beekeepers Asso.

2:00—"This is South Atlantic Beekeeping," Harold L. Kelly, Pres., Md. State Beekeepers Asso.

3:00—"Honeybees and Soil Conservation," Dr. Benjamin Isgur, Soil Conservationist, Amherst, Mass.

3:30—Demonstrations in the college apiary: Requeening, Hiving a Package, Moving Colonies with Ammonium Nitrate, Practical Swarm Control, Removing the Honey Crop, Assembling a Beehive.

6:00—Dinner, dining hall.

8:00—Square dance, Eb and Ely square dance callers and orchestra. Saturday, June 18—

9:00 a.m.—"Photo-Periodicity in Plants and Animals, Dr. H. A. Borthwick, Beltsville Research Center.

9:30—"Control of Insects Through Microorganisms," Clarence G. Thompson, Beltsville Research Center.

10:00—"Normal and Allergic Reactions to Honeybee Stings," Dr. Howard M. Bubert, Head, Allergy Clinic, University of Maryland Hospital.

10:30—Bus tour of Beltsville Agriculture Research Center and visit to U. S. Bee Culture Laboratory.

12:30 p.m.—Lunch.

2:00—"Royal Jelly," Dr. Tage S. K. Johansson, Queens College, Flushing, N. Y.

2:30—"History and Present Status of Treatment of Bee Diseases," Albert G. Michael, Microbiologist, U. S. Bee Culture Lab.

3:00—"Colony Morale and Swarm Control," Prof. Ed. J. Anderson, Pennsylvania State University.

3:30—Panel discussion—questions and answers.

7:00—Banquet, dining hall. Toastmaster, Harold J. Clay; address, speaker to be announced; presentation of awards: Photo contest, slogan contest. Sunday, June 19—

8:30 a.m.—Breakfast, dining hall. Chapel services, Univ. of Maryland Chapel.

10:00—Bus tour to places of interest in Washington (optional trip).

12:30—Lunch, dining hall.

2:30 p.m.—Farewell.

Arrangements: The center of all activity will be the Apiculture building. This is located directly across the Stadium Drive from the West Gate of Byrd Stadium. There is unlimited parking space. Busses and cars should make the first campus stop at the Apiculture Building, where registration will take place and rooms will be allocated and arrangements made for meals. Those coming from a distance will probably arrive Thursday afternoon and evening (June 16). Those desiring dormitory lodging on the campus should make reservations in advance so as to give us some indication of the number of rooms needed. Local beekeepers and some from nearby states will probably not arrive until Friday morning (June 17); however, they should reserve rooms in advance as needed.

All sessions will be held out-of-doors, weather permitting, in the picnic area at the Apiculture Building. In case of rain the Ritchie Coliseum has been reserved for our use (public address system at both locations).

## Connecticut Association, June 25, Goshen

The June meeting of the Connecticut Association, will be on June 25 at the home of Mr. and Mrs. Macklin Cunningham, Goshen, beginning at 10 a.m., with a speaker on the program. A feature of the day will be a standard brood comb contest open to all beekeepers, with several prizes. Lunch will be pot luck and the meeting will be held rain or shine.

Philemon J. Hewitt, Jr.  
Chairman of Publicity

## Cook-DuPage (Illinois) Host To State Meeting July 24

The Cook DuPage Beekeepers Association will sponsor the Summer meeting of the Illinois State Association Sunday, July 24, starting at 10 a.m. at the Fernwood Park, 104th Street and Lowe Ave., Chicago, Ill. Program in next issue. For further

Information contact A. J. Smith, Sec'y., Worth, Illinois.

**Middlesex County (Mass.)  
Wellesley Hills, June 25**

The Middlesex County Association (Mass.) will hold its second outdoor meeting of the season at the home and apiaries of member Olga S. Allers, 61 Hunnewell Street, Wellesley Hills 82, Mass. This is the first time that a meeting has been held at Mrs.

Allers' home and the members look forward to it with great pleasure. The meeting will be on Saturday, June 25, at 2 p.m.

The first outdoor meeting of the season will be on Saturday, June 4, at the home of Mrs. Fitzgerald in Weston, Massachusetts. This is the May meeting, but it was postponed one week because of the Memorial Day weekend. A large number of members and guests are expected at our first outdoor gathering, and it is

indeed a pleasure to see our newer members attending the first outdoor meeting.

L. C. Proctor, Sec'y

**Iowa Annual Summer Meeting  
Stratford, July 9**

The Iowa Beekeepers Association has accepted the kind invitation of Mr. and Mrs. Carl Soder, of Stratford, Iowa, to hold the annual sum-

(Please turn to next page)

## "Bee Wise-Woodmanise Your Bee Supplies"

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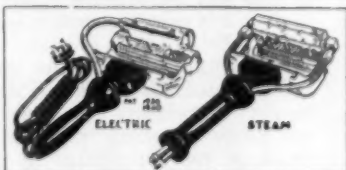
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## JOHN J. MAENDEL

Forest River Colony

Fordville, N. Dakota

## MEETINGS —

(Continued from page 247)

mer meeting of the association at their new honey house on Saturday, July 9. Details of the day's activities are being developed for announcement in the near future.

F. B. Paddock, Extension Apiarist

### **The American National Honey Show August 12-20, Springfield, Illinois**

The Illinois State Fair is sponsoring the National Honey Show this year August 12 through 20.

For the past two years this show has been held in connection with the Minnesota State Fair at St. Paul. The show was started by Mr. C. D. Floyd, Apiary Inspector for Minnesota, who was its superintendent for two very successful years.

Now that the show is coming to the state of Illinois I wish to continue to have as good a show as did Mr. Floyd. In fact, I have a selfish motive in wanting to improve the show by having a larger list of entries. I find that I cannot make any improvement in the way it was handled in St. Paul, but we do want more entries. I think that the honey producers have let Mr. Floyd down by not making more entries during the last two years. We can, with just a very small effort, make this show one of our best advertising mediums to date.

To those who have given such fine trophies and who are giving again this year I want to say thanks. You people are doing a splendid job by giving valuable trophies. Now the beekeeper must do his part.

The premium list has been with the printer now for some time and should be available for mailing any day. To those who are interested please write to me for a copy of premium list. More news later.

Carl E. Killion  
Paris, Illinois

## **Honey Labels**

Our honey labels will tell your story, by word and picture to encourage sales. Our sample label catalog is yours for the asking. Each label in complete color and each one separate (an actual label) to put on your container to see how it looks.

**American Bee Journal**  
Hamilton, Illinois

# Editorial

## Research —

### **The Key to Opportunity**

The American Assembly met recently and predicted that the long-run answer for agriculture is fewer farmers instead of higher prices for farm crops and produce. The American Assembly is a national nonpartisan group made up of leaders of big farm organizations, operators of big and little farms, government and university agricultural experts, and businessmen.

Business Week reported that the notion that lagging farm income is a drag on the American economy as a whole got short shrift from the assembly's technicians. They pointed out that farm income amounts now to only 5 or 6 per cent of total U. S. income—a trend that has been going on since the United States began—so even a 20 per cent drop in farm income would produce only a 1 per cent drop in total national income. They pooh-poohed as a myth the idea that there is something peculiarly crucial about movements in farm income compared to that of other industries.

What can this mean to the beekeeping industry? Fewer farmers should mean bigger farms operated in improved and more efficient ways, but will that mean more legumes—more bee pasture? Frankly, we do not know. We are inclined to be somewhat pessimistic. The fact that a drop in agricultural prices means little to our national income and that honey prices can follow such a downward trend has serious meaning to us, naturally.

There appears to be at least three things that hold great possibilities for progress of the bee and honey industry. They are RESEARCH, HONEY PROMOTION, AND POLLINATION.

We must establish an adequate and effective program for promoting the consumption and sale of honey if we are to continue to have a healthy and prosperous industry. Pollination holds much for the large operators but little opportunity for the small and medium-size bee-

keepers. But the greatest opportunities for the industry lie in RESEARCH.

The Research Committee of the American Beekeeping Federation has requested \$200,000 additional funds for research on pollination, honey house and beekeeping equipment, and on honey. This is a wise and worthy request. It should have the support of Congress and the U. S. Department of Agriculture. Recently Secretary Benson recommended to the President, as a part of his program to aid low-income farmers, to develop needed research in farm and home management, human nutrition, and marketing. And we feel sure that bees and honey should have a part in that program.

For example, what do we know about the nutritional value of honey which makes it a superior sweet? We're just beginning to study the chemical constituents of crops the way chemists have studied petroleum. More work has been done on the chemical composition of citrus than any other crop. We now know some 150 different chemical constituents in the orange, and experts tell us there are probably another 100 which haven't been separated and identified. But what do we know about honey?

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Yes, RESEARCH is the golden key that can open the door of unlimited opportunity for the bee and honey industries. Through RESEARCH, the possibilities for progress are tremendous!

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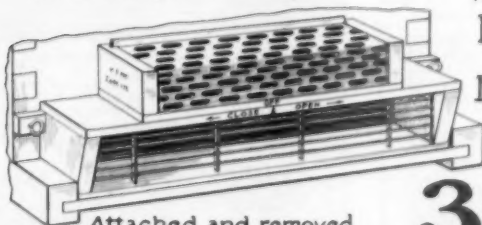
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# CROPS and MARKETS

by M. G. Dadant

The 1954-55 winter was punctuated by a shortage of fall flow and subsequent shortage of young bees. Added to this, in northern areas, the winter was in many cases prolonged and as a general rule you might say that winter losses were quite heavy. This extended practically all over the country from east to west, especially for the northern half. This also contributed to light stores and some starvation which probably has continued into the spring season unless the beekeeper was thoroughly forewarned.

## Making Up Losses

In practically all instances beekeepers are endeavoring to make up losses, although the cold spell in the South just at the beginning of the package season has mitigated against getting as many packages as might have been desired early in the season. In mid-May, conditions were approaching normal in the southern areas but this was felt to be too late by many buyers in the North. There was also quite a large making up of packages by divisions where queens were available and in this instance the same difficulty in the South was evident, in mid-April at least.

## Increase

As a general rule, very little increase is being made this season according to our reports. There will be some increase in the northern mountain areas and on the West Coast, particularly California where the call has been extremely heavy for bees for pollination.

Otherwise we might infer that beekeepers will do well to make up their number of colonies or perhaps to fill some of their empty equipment. Such increases will be made in the northern and eastern areas and would likely come from the smaller beekeeper of from one to one hundred colonies.

## Honey Bee Conditions

As stated above, losses were heavy but are being made up by either packages or divisions and such bees as are in full colonies likely are at normal strength in most areas. In fact, in northern areas and extending through the provinces of Ontario, undoubtedly the overwintered colonies, except for a few weaker ones, are perhaps in more than average

condition. There are, however, reports of lack of floral nectar and this extends pretty well into the plains area and into Colorado, New Mexico, and even into Arizona.

All in all, however, condition of bees was probably at normal by May 15 and probably better than normal where winter losses could have been made up. New York apparently was one of the heaviest sufferers from winter losses.

## Honey Plants

Approach of the season, of course, always revolves around the honey plant conditions. It is safe to say that in all the northern sections from the Atlantic Ocean to the Missouri River, honey plant conditions are excellent, no doubt much better than a year ago. This does not signify, however, that the little Dutch clover is plentiful everywhere because it is not, but the combination of circumstances makes it look like the prospects, in the areas above mentioned as well as in all Canadian provinces, are much better than they were in 1954.

The honey crops along the South-east have so far been short and if a honeyflow comes it will likely have to be from sourwood and gallberry.

In Florida, the orange crop is already harvested and probably was 85 per cent of last year with extreme dry conditions cutting down both the mangrove and the palmetto crops. The total crop will hardly be as much as last year. Through the South, conditions are about normal if you discount the losses both in bees and in forage caused by the early freeze. Tennessee and Kentucky are about normal and Arkansas as well. Louisiana is likely still suffering from the drought and this, of course, extends into Texas and westward. The orange flow in the Rio Grande Valley was almost a failure but eastern Texas and extending into southern Oklahoma have had some beneficial rains with the possibility for honey both from vetch and from annual sweet clover.


The plains areas are still suffering from a shortage of legume crops occasioned by the fall and early

spring drought and this condition now extends into South Dakota as well as in southern Colorado.

Montana seems to be quite near normal and conditions seem fairly satisfactory for moisture throughout the irrigated sections. Utah still complains of drought conditions.

The Northwest apparently is in quite satisfactory condition although the early spring was cold and disagreeable. In California, conditions also were affected by the cold weather. The orange crop, however, is developing quite well, probably will exceed last year, although two conditions are mitigating against it. One of these is the continuous encroachment of population on the once great orchards, and the other is the possible overpopulation of bees in orange groves just before going to their next job of pollination.

Earlier cold weather and drought have been alleviated by rains in late April and it seems quite evident that this year's California crop will exceed that of 1954, probably in the orange areas and possibly in the sage and desert areas as well. There are more bees in California than a year ago but also many more devoted to pollination although perhaps the increase will make up for this diversion.



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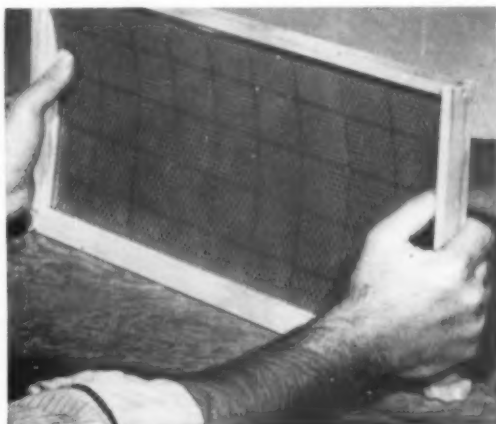
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## Dadant's Gilt Edge Foundation

### Gilt 4-Edge

Just fit together a Lewis Nailless Topbar frame, then set one of the long Gilt edges of a sheet of Dadant's Gilt 4-Edge foundation into the groove of the inverted topbar. Then fit the bottombar of the frame over the other long edge of the foundation and nail the ends of the bottombar into the side bar recesses using the nail holes already pierced for it. Simple, isn't it? And it takes only a minute of time.



### A Magic Combination

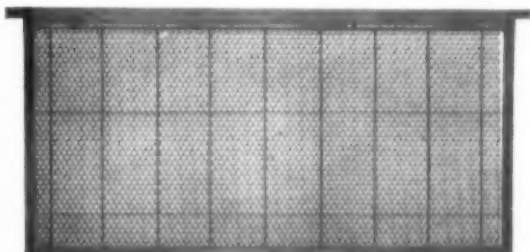
When you use the new Lewis Nailless Topbar Frame, you can assemble frame and foundation in less than a minute. There are only two nails to use; no frame wiring to do; no embedding to do.

### Gilt 3-Edge

Three metal edges, one on each side and one on the bottom with the familiar crimp-wired hooks along the top edge. With a slotted (or two piece) bottombar, slip the long metal edge of the foundation into the slot of the bottombar; then nail the frame wedge under the hooks of the top edge of the foundation. There is no wiring to do as the wires are all in the foundation, saving you hours of time.

## Dadant's Crimp-wired Foundation

Dadant's Crimp-wired Foundation makes everlasting combs. Each crimp in each wire exerts a steady pull to keep the pure beeswax sheet in exact center. The wires are specially shaped and embedded for the exact needs of perfect combs. They are of special steel so they do not bend out of shape and the hooks hold any weight the combs can put on them.

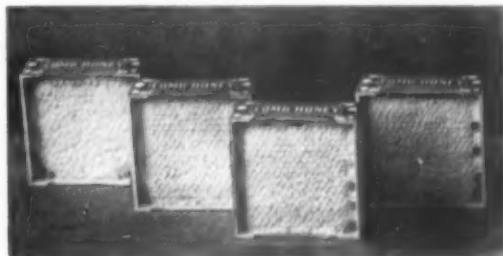


Gives you combs as permanent as your hives; produces combs of full worker cells that make larger colonies, greater crops, more profit. Hundreds of thousands of these fine combs have been in use twenty or thirty years. Such combs will cost you less and last a lifetime. Two horizontal wires put in by hand will hold foundation at center.

## Dadant's Surplus Foundation

### Section Comb Honey

Dadant's Thin Super Foundation is so thin and clear you can see through it. It will give you quality section comb honey. The biting quality at the base of the honey is such that the wax crumbles under the tongue; delicate, tasty, downright good.



### Cut Comb Honey

Honey markets want honey, cut from the combs and put in cellophane wrappers in cartons, or packed in glass with liquid honey. You must have shallow super combs with honey having a fine finish. Either Dadant's Thin Surplus or Cut Comb Foundation will produce just the kind of honey you want for this purpose.

**DADANT'S PLAIN FOUNDATION**—Without wires, for those who have their own way of assembling and wiring foundation. Made by Dadants for over seventy-five years. Each sheet inspected; packed in tissue, in tight-fitting cartons.

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